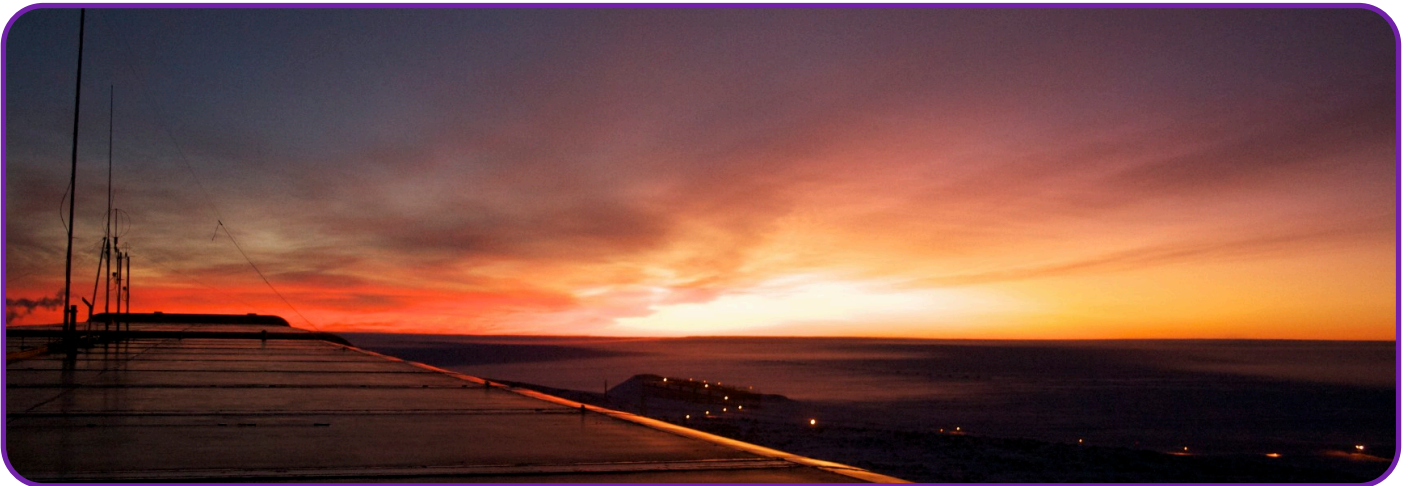


# SANAE 51



THE NEWSLETTER OF THE 51st SOUTH AFRICAN NATIONAL ANTARCTIC OVERWINTERING EXPEDITION



## PENGUINS vs POLAR BEARS

In this edition, read about the differences between the Earth's poles, storm damage, the SANAE communication and weather systems, and more..

### PERIMETER BREACH

Johan du Plessis

Being part of a self supported team of 10 members in an inhospitable continent like Antarctica is what we signed up for. Although we have become familiar with our base and surroundings and do not talk or consciously think about this point very often, in the back of our minds we realise that we are on our own. We are the fire brigade, the ambulance service, the emergency plumbers, garbage collectors, the water treatment operators, the water melters, the breakdown mechanics, the cargo handlers etc. On top of that we live in an environment that will not



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be possible without this base, similar to living on Mars or on a boat. Without the vessel life is not possible. This fact becomes very pronounced during storms where it becomes life threatening to be outside this base.

A few days ago we had quite a memorable storm and our "familiarity" was disrupted slightly. The wind averaged around 90 knots and the whole base was shaking and trembling with the force, something we have become accustomed to. I walked to the Wet Lab to ensure that the glass lab equipment was safely packed away. As I neared the lab the doors of some offices were shaking violently in their frames. I went into the leaders office to

investigate only to find the wind howling through the window and the blind flapping loudly in the wind. It was bit of a shock and it took me some time to compute what happened and what needs to be done. The window wasn't left open, simply because it cannot be opened. Living in South Africa the thought of a burglary crossed my mind but there is no one here. As it turned out some of the antennas on the base's roof broke in the strong winds and one of the connectors of an antenna, which was attached to the stay rope, crashed through our triple layered window.

Luckily Stef was nearby, as I went looking for timber to make a temporary shutter, she spread the word and everyone jumped into action. After some 30 minutes of flying glass and freezing temperatures we succeeded in closing off the base's breached hull. ☺



## THE DIFFERENCES BETWEEN THE NORTH AND SOUTH POLES

Jon Ward

### Location

The geographic North Pole is located at the northernmost point of the planet in the Arctic Ocean. This region is surrounded by the lands of Canada, Greenland, Russia, Norway and a few other countries. The North Pole itself is actually frozen ocean, a huge chunk of constantly

shifting ice, floating atop a large body of water. In the Arctic winter, this ice mass naturally expands over the Arctic region and then recedes as it melts during the Arctic summer.

The geographic South Pole is located on the continent of Antarctica, a land mass at the southernmost point

of the planet. Antarctica is also covered by ice but the size of the ice-shelves remains relatively constant throughout the year. The sea-ice surrounding Antarctica also freezes and grows in size during the Austral winter and then thaws in the summer.

The more rapid freezing and thawing cycle in the Arctic can be contributed to the fact that the ice is submerged and the ocean currents bring warmer temperatures to this area.

The stony bedrock of Antarctica is not affected by this phenomenon.

### Temperature

The South Pole is much colder than the North Pole. This is due to a combination of its higher elevation and, as mentioned before, due to the fact that the ocean brings warm water to the Arctic. The average difference in temperature is around 15°C but an even bigger difference can be seen during the summer. The temperature seldom rises above 0°C in Antarctica and as a result there is very little ice melting. Due to this fact, Antarctica hosts 90% of all the ice on Earth, which makes up for 3/4 of the global fresh water reserves.

### Animals

The air and sea temperatures at the top of the globe are generally warmer than in the south, making the Arctic a more habitable place for living things. The huge icecaps and extremely low temperatures of the Antarctic make it difficult for most living things to survive there. The Arctic is, therefore, home to more plants and animals than the Antarctic.

Tree lines have developed at some areas and there are many areas with thriving moss and other low lying flora. Mammals such as the ox, fox, reindeer and bears also abound in the Arctic. Many marine animals also live in the North like whales and seals.

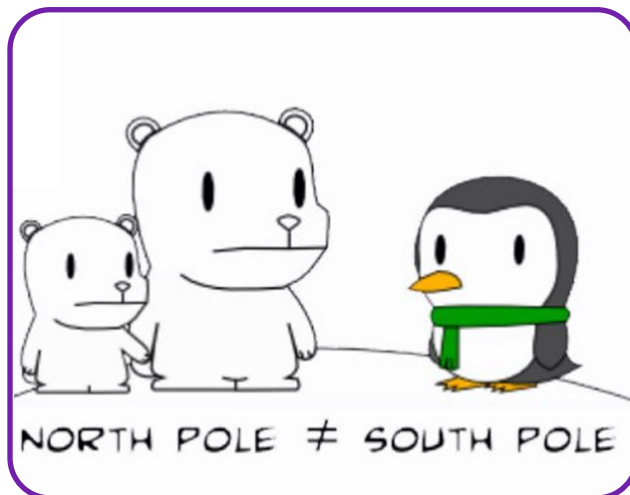
One common misconception is that Polar bears and penguins share the same habitat. This is not true. Polar bears only inhabit the Arctic region, where they prey on seals, sea cows or the occasional whale; this is probably a good thing for the penguins, which are only found in the South, as they would probably be easy prey for the bears.

### People

The Antarctic continent is the only place on Earth that belongs to nobody. No traces of indigenous people have been discovered yet, and the region is governed by the Antarctic Treaty, which stipulates

that the territory itself, and its resources, should be used solely for peaceful and scientific purposes.

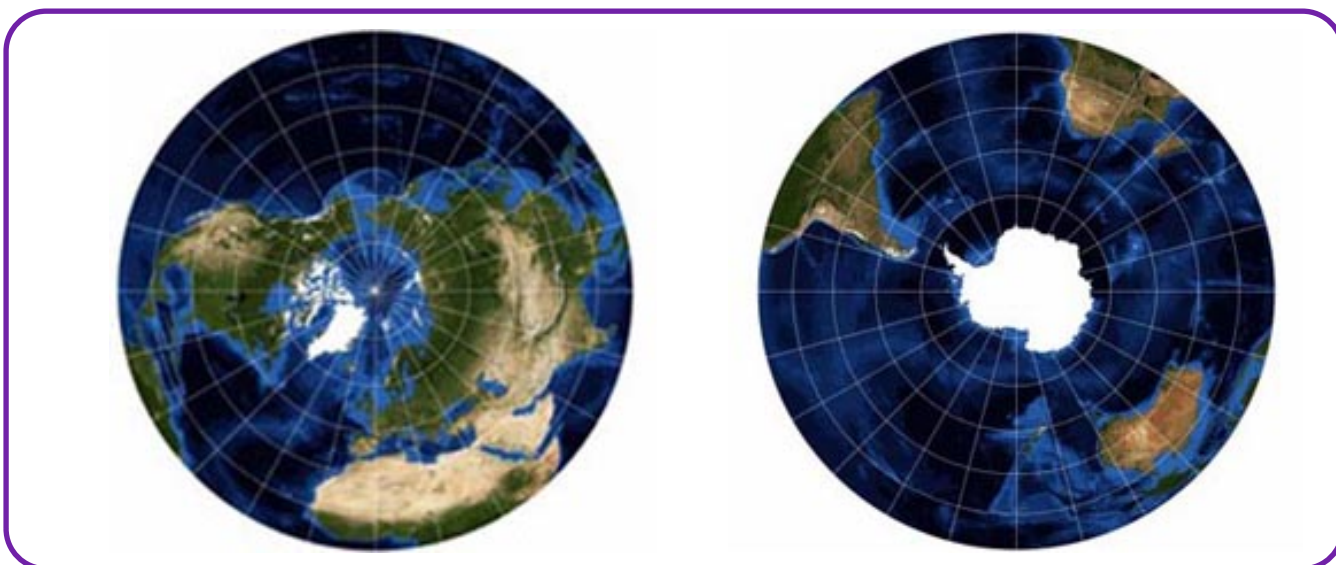
In contrast, more than four million people live inside the Arctic circle, both in small villages and in towns, such as: Barrow, Alaska; Tromso,



\*\* [www.zazzle.com](http://www.zazzle.com)

Norway; Murmansk and Salekhard, Russia.

People rarely set foot in Antarctica and they do so only on research and scientific grounds. The North Pole, on the other hand, has native people and ethnic groups living there such as the Inuit people (Eskimos) and Santa Claus. ☺



Northern and Southern hemispheres respectively showing the North and South poles

\*\* <http://www.icsm.gov.au/mapping/coordinates.html>

# WATER SHORTAGE

Stefanie Strachan

We have been very fortunate so far in the sense that very few things have broken or gone horribly wrong, but on the weekend of the 20<sup>th</sup>, nature decided to give us a little taste of what life in repair-mode would be like. As you would remember from a previous newsletter, we explained how we make water at the smelly, how it gets pumped up to the base and then stored in different tanks in the hangar. In general, we try to keep the water levels in the base as high as possible, so that if we do get a sudden storm, we'll have enough water to survive for a few weeks without having to go outside to smelly. On the 19<sup>th</sup>, some of the guys noticed a sudden drop in our water levels, and discovered that the one tank had burst, causing a water loss of about 10000 litres. Luckily Johan and Vince were quick to jump into



their plumbers' outfits and bypass the broken tank, containing the leak.

Generally a broken tank would not be such a big issue, but since we had a major storm

on the way, the chances of being able to make up the lost water with lots of smellying looked quite slim. Laundries were closed and showers were to be used sparingly. Luckily the storm wasn't too heavy yet, and a few braved the 30-40knot winds for a double smelly session. The 40knot winds soon turned to 90knot winds and no further going outside was allowed.

Plan B - no showers till the water levels are normal again.



By Saturday afternoon the storm was still raging, the wind and snow finding its way into the base through every possible little hole. This, along with the fact that we had a broken window that let the freezing wind into the base for at least half an hour, caused the temperature inside to drop significantly. In some of the offices and labs the temperature was less than 0°, causing some of the water in the pipes that run through the ducting to start freezing. So now we had a new worry, if the pipes freeze, they might burst, causing even more of the little water we had left to leak out. Some quick thinking and acting from our base engineer, along with the help of a few heaters, saved us a lot of trouble in trying to find and fix broken pipes.

As soon as there was a break in the storm, everyone was quick to grab their extreme weather gear and go smelly or help to secure the smelly line before the wind picks up again. It was also then discovered that among other things, the VLF antenna broke, causing a few sleepless nights for Braam, some of the antennas on the roof were loose, and the HF antenna, along with some of the science equipment had been damaged. All of this having to wait a few more days for the storm to pass.



Since then, most of the storm damage has been fixed, and our water supply is back to normal, so luckily S51 no longer refers to stinky 51. ☺

# T3

Jako Bester

So there I was standing in my office knowing there was something that I was supposed to come and do here...something work related...it had completely slipped my mind what it was. So I decided to go back to the dining area to make a cup of tea and try and remember what it was that I was trying to remember. Sitting there still pondering my predicament, I watch as one of my fellow 'zoned out' overwinterers absentmindedly pours boiling water into his Oros concentrate from the Hydroboil. Fortunately, realizing that the warm sensation transferred from the glass to his hand was not the normal 'cool'drink that he had set out to prepare, he chucks it into the sink. Meanwhile another overwinterer started to give me the creeps while staring me into oblivion while stroking his beard "deep in thoughtful/lessness", I decide to rather venture elsewhere, trying to recover my initial train of thought... By the time I realize what I had

gone down to my office to do, the evening supper announcement arrives and I am again distracted from my goal.

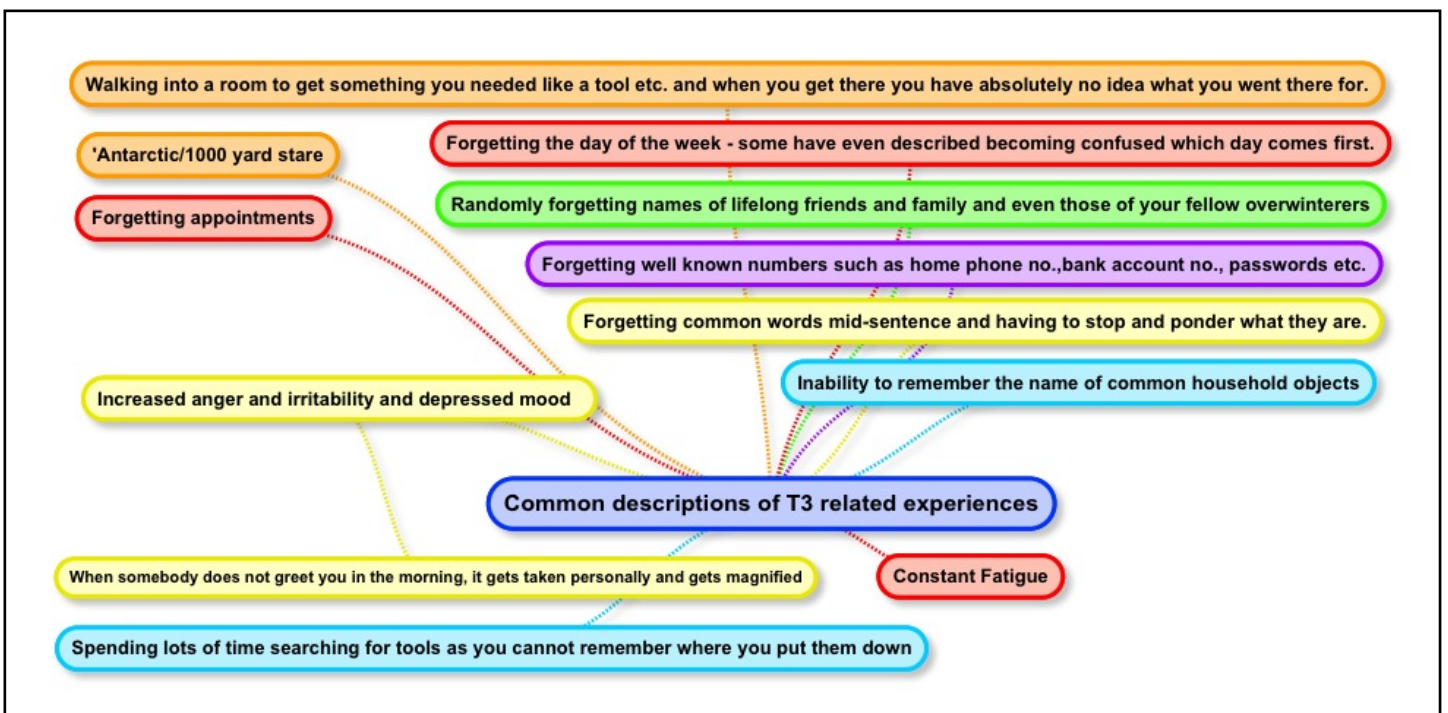
Most people at home will think this is some strange behaviour or a sign of early Alzheimers or may even be reminded of a scene from a mental asylum.

Well, to most of us overwinterers at SANAE, we have grown to live with and accept each others' quirky behaviour as on occasion, the fondly referred to 'T3', tends to affect all on the base. In most cases everyone just shrugs off some strange behaviour that generally tends to also produce a few laughs as someone forgets important names (at least not their girlfriend's yet) or loses their train of thought mid conversation.

So what is this 'T3' phenomenon that we tend to blame for our forgetfulness? Well it basically refers to the 'Polar T3 Syndrome' that is observed in especially long term or overwintering polar expeditioners.

It forms part of the so-called "overwintering syndrome" which includes/overlaps the other effects of seasonal affective disorder, vitamin D deficiency (due to lack of sunlight - described in previous edition), isolation and stress. Now I will attempt not to bore you too much with all the medical mumbo-jumbo like last time:

T3 refers to the thyroid hormone - triiodothyronine - which in turn is responsible for quite a few things in our bodies such as forming part of metabolic and heat regulation, glucose metabolism, protein synthesis, lipid (fat) breakdown, and also has a role to play in the regulation of neurotransmitters ('messengers' in the brain). So in short, what the big cheeses in the medical and physiological fields have postulated thus far is that as part of the body's heat regulation, it basically diverts the T3 hormone to the muscles to keep the body warm, thus causing a relative shortage in other areas, for example the brain, hence the majority of the symptoms.



Researchers believe that though it appears to go hand in hand with vitamin D deficiency or lack of sunlight, as described in our previous edition, it may in fact be more temperature related. Some studies are still in progress to test the theory where different kinds of light versus the effects of different supplements are compared.

So in the meanwhile, how do we combat these effects: Well, patience with our fellow overwinterers' forgetfulness, not taking offence when ignored, or being in the line of the 'Antarctic stare'. Remaining organised by keeping schedules or lists. Keeping fit and healthy, eating a balanced nutritious diet and taking our supplements and vitamins along with some additional vitamin D.

Making effort to doing something uplifting such as playing games, sports or watching something in the tv lounge such as sea, sun and surf that reminds us of home, and laughing regularly.

Fortunately all of these effects remain temporary and research has shown that thyroid levels remain normal upon return home and all the effects are reversed. ☺

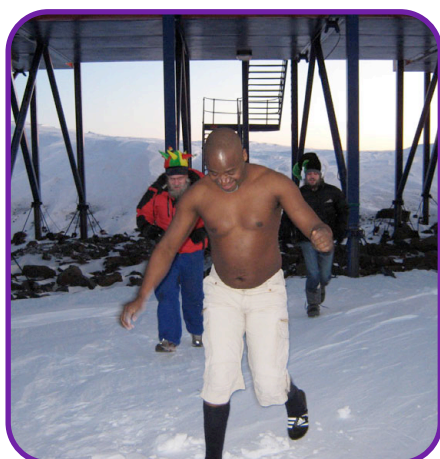
## BIRTHDAY DOUBLE WHAMMY!

Braam Beukes

Celebrating your birthday in Antarctica isn't something that happens every day. That is why it has to be a day to remember. July is a month that was very special in terms of birthdays since two of our team mates enjoyed their birthdays in this month. Adding to the excitement was the fact that the two birthdays were on two consecutive days! How often does that happen?

The birthday boys, Elrich and Michael, approached the dates with some hesitation as the thought of the snow bath was weighing on their minds. There was talk of having a combined snow bath and of maybe not having a snow bath at all! Everyone wondered what would happen when the time finally arrived.

Luckily on the 25<sup>th</sup> of July, on Michael's birthday, all the speculation of what was going to happen with the snow bath was laid to rest with Michael bravely taking on his snow bath with a smile on his face and a determined look in his eye. Maybe it was the lovely cake and pudding that was lovingly prepared by team members which swayed his decision to bite the bullet and go for it, we can only guess. Congratulations Michael!



Elrich was next with his birthday on the 26<sup>th</sup> of July. After tea and cake it was time for the snow bath. Not being one to disappoint, Elrich dressed up for his snow bath in a Springbok flag. I do not know if that helped with the cold or not but the snow bath went well and was enjoyed by all, even Elrich, I think. Congrats

Elrich!

Thank you to Elrich and Mike for making July a month to look back on with fond memories of birthday cake and snow baths. From the whole of the S51 team I would like to wish them a wonderful year ahead and would like to thank them for sharing their special days with us. ☺

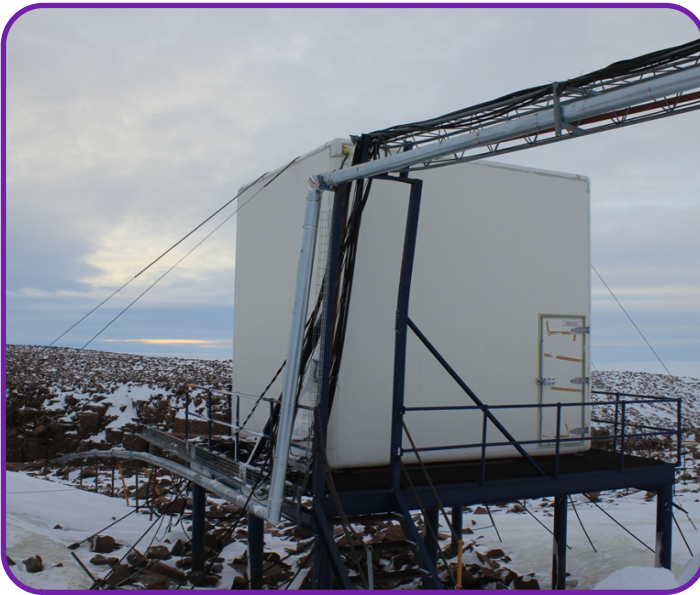


# COMMUNICATIONS AT SANAE IV

Elrich Delpont

At SANAE IV the main communications is via a satellite link. The signal is relayed via an Intelsat which is situated over the equator. Due to Antarctic conditions, the 3.7m sat dish at SANAE IV is in a sealed container

In and around the base we make use of VHF two way radios as a means of communication. These radios operate in harsh conditions and because of the sub zero temperatures,

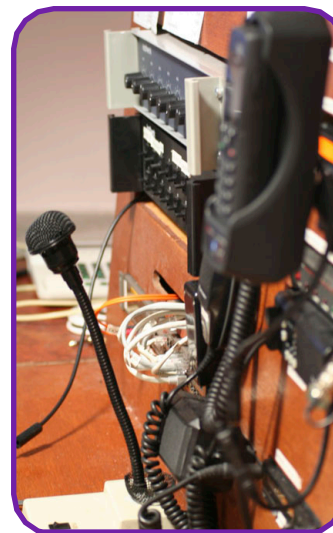


for protection against the elements. There is also a similar sat dish in Cape Town, which completes the link and allows us communication to the outside world. The satellite bandwidth is shared amongst SANAE IV, Marion and Gough islands, and also the SA Agulhas II. This satellite link facilitates all internet and telephony needs. Our network is also divided between public and science protocols to give priority to all science programs running at SANAE IV.

during CAT trains. All radio activities are monitored and scheduled, during which the position, situation and weather conditions are confirmed. The HF radio is also used to communicate with the SA Agulhas during take-over periods. This is mostly to gather information

the battery life is limited. All our vehicles are fitted with GPS navigation and VHF radios for regular operations. One challenger also has an HF radio fitted to allow for longer range coverage

regarding helicopter flights from the ship to SANAE. We also have an Air-band radio which is used to communicate with all aircraft entering our reception area. A strict protocol is maintained during all flight schedules to provide fuel, cargo and passenger information. In order to monitor the helicopter flights, we also make use of an online, web based GPS program that allows us to follow the progress of each flight. Last but certainly not the least is our Iridium Satellite phone, which uses the Iridium satellite constellation to



enable/establish communication. For obvious reasons this phone is our lifeline and the only means of communication with the outside world, should we encounter any emergency where our normal communications has been cut off. ☺

# ANTARCTIC FOOD FESTIVAL

Stefanie Strachan

The social life of the average Antarctic overwinterer can become quite dull, so when Pepe, the chef at the German base, Neumayer III, had this brilliant idea of an

Antarctic Food Festival, the members of SANAE 51 were quite keen to join in on the activity. The rules were



simple. Each team that decides to participate is required to nominate a single ingredient.

These ingredients then form the common 'shopping list'. The goal of the food festival is then to create a menu, a special dish, or even just something

edible using all the ingredients on the list. Only basics like salt, pepper, milk, butter, oil and flour can be used additionally. Most of all, the point was to have some fun in the kitchen with your team.

This year ten stations participated and nominated an ingredient. Our shopping list consisted of:



Carrots, Pineapple, Nuts, Beetroot, Beef, Bacon, Ginger, Salmon, Olives, and Hickory Wood Chips. After a quick shopping spree, the ingredients were ready and the brainstorming could begin. It didn't take long to decide on something from back home, and our plan was hatched.

Everyone jumped in to help, some more with eating than actual preparing, and a few hours later we had a true South African dinner ready.

Our menu included:

- Carrot and pineapple salad
- Beetroot salad
- Beef, bacon and pineapple sosaties
- Ginger fish puffs
- Olive, cashew and ginger dip 🍴



## WEATHER IN ANTARCTICA

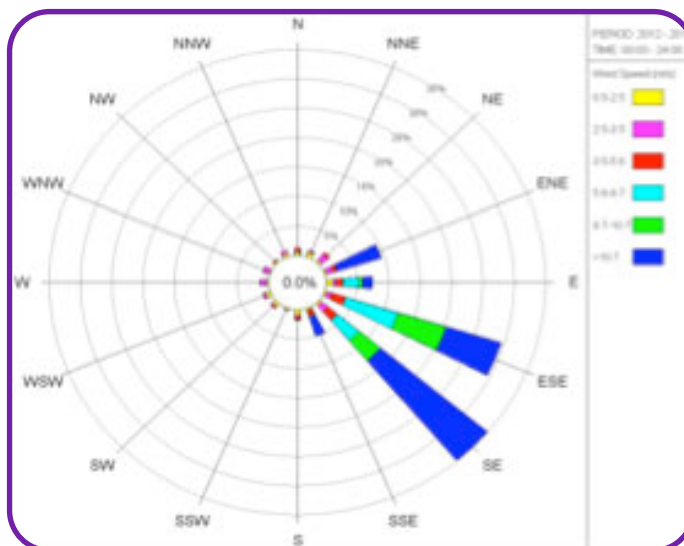
Mcabango Biyela

Many people think of Antarctica as a scary continent because of many things they have heard before. Whatever you want to do on this continent, a mere fact is, you have to check the weather because the conditions are not conducive for human activities outdoors every day. Weather in Antarctica is simple and predictable because we don't have much weather phenomenal like thunderstorms, cyclones, rain, tornadoes, etc. We do, however, experience blowing snow, strong winds, blizzards and whiteout conditions, plus the Photometeors like Diamond dust, Auroras, halo and Corona, etc.

### What kind of weather does Antarctica experience?

#### **Wind:**

Antarctica is the windiest continent on earth. Storms are



Wind rose representing the wind direction and speed

common and are frequently very energetic and dramatic. Between 50°S and 60°S the Westerly winds are driven by the pole/equator temperature gradient. Below 60°S,

winds are largely katabatic, which is a result of cold air forming over the pole and falling (as cold air is heavier). The pole is on a high plateau 3,000m (10,000ft), so the cold air falls down the slope, getting faster as it goes. By the time it gets to the coast, the earth's rotation (Coriolis force) makes the wind Easterly.

#### **Clouds and Temperatures:**

Estimations of cloud cover have been problematic in Antarctica as the whole landscape is difficult to estimate. Features that may seem a distance of a few km can actually be 50km or more. This makes cloud height estimations particularly difficult for aviation purposes.

Temperatures are very cold, ranging from 0°C to -45°C, with the apparent temperature being able to go down to -65°C.

#### **Blizzards/Whiteout:**



A blizzard is the combination of high winds and blowing snow, where the snow may or may not be falling from the sky. Most precipitation falls as snow in Antarctica.

When snow falls in low temperatures, or when ice crystals in the air settle, they are only very loosely bound together, and so may be blown around for a long time. The result is that there is often blowing snow in Antarctica without there being very much precipitation. A blizzard may easily lead to whiteout conditions when it is impossible to see surface features. The whole world is just a big white blur, and this can be very dangerous as it is possible to walk over a cliff edge without even being aware that it is there.

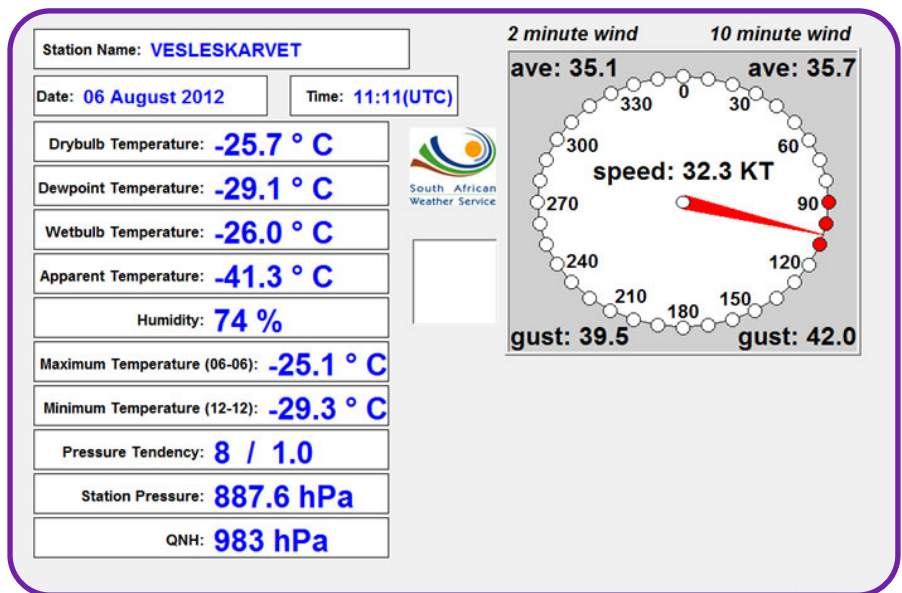
### 5 reasons as to why the Antarctic continent is cold?

#### 1. Fewer daylight hours

Fewer daylight hours starts the list off. This is only relevant in the cool season (especially winter). In the winter, there is very little daylight above the Antarctic Circle. Without the sun's energy to warm the surface, surface temperatures chill significantly. In the warm season (especially summer), there is actually more daylight hours in the polar areas. Above the Antarctic Circle, there is near 24-hours of daylight in the summer. Temperatures in the polar areas are much warmer in the summer as compared to the frigid winter.

#### 2. Less tropospheric vapour

Water vapour is the most significant greenhouse gas in the lower troposphere because of its large quantity. In equal amounts, carbon dioxide is a much more powerful greenhouse gas than water vapour, but generally there is much less carbon dioxide in the air when compared to water vapour. The



MetCap weather displaying system

amount of water vapour in the air is controlled by temperature and the potential for water vapour to be evaporated or transported into a region. Because of the cold, polar air has a low capacity to evaporate water vapour in the air. The result is air with a low amount of water vapour. With less of this greenhouse gas in the air, less long wave energy is absorbed in the lower troposphere. More long wave energy escapes to space, thus helping to lower surface temperature as a whole. Only in the summer does it really get warm enough for significant water vapour to exist.

#### 3. High albedo

Albedo is the ratio of light reflected from an unpolished surface to the total light falling upon that surface. Low, thick clouds, such as stratocumulus clouds, reflect incoming solar radiation, causing it to have a high albedo,

Ice, water and snow are good reflectors of solar radiation when the sun angle is low (sun near the horizon). The sun angle is fairly low throughout the year in polar areas, so a significant amount of solar radiation that does reach the polar surface is reflected back into space.

#### 4. Tropospheric length

The tropospheric length is the length a beam of solar radiation must travel to make it from the upper troposphere to the earth's surface. This distance is minimized when the sun is directly overhead and is maximized when the sun is near the horizon. When the sun is near the horizon as in polar areas, more solar radiation is scattered and reflected by the atmosphere than when the sun is more directly overhead. This results in some solar radiation not reaching the surface that otherwise would have in lower latitudes.

#### 5. The sun angle

It is low sun angle that makes the tropospheric length longer, reflection higher, the air colder (thus less water vapour), and the daylight hours fewer in winter. You will notice when looking at the shadow from a tree that it becomes longer as the sun moves closer to the horizon. When the sun is near the horizon, solar radiation is spread over a larger area. Thus, the intensity of solar radiation is far less at the polar areas than in the low latitudes. When the solar intensity is less, the Earth's surface cannot warm as rapidly.

**Why we observe weather in Antarctica?**

Observing weather in Antarctica is essential, not only for the South African Weather Service, but also for all other Weather Services worldwide who make use of the data for various modeling and forecasting products.

Doing weather observations, is much, much more than just reading and observing various weather elements. It is about understanding how weather occurs. This is a vital part of the work, and all Meteorological Technicians and Forecasters, no matter where they stationed, should be aware of the potential irregularities that could occur, especially with the electronic sensors that are now replacing many of the older analogue type instruments.

Weather observations, including temperature, moisture, pressure, clouds and wind speed and direction, are the basis for the weather forecasts we rely on every day. South African Weather Service has been observing the weather since the 1960s and continues to serve as the primary source of weather data in the Antarctic

Continent, forecasts and Research organizations. Weather observations are collected, quality-controlled, and used in numerical weather prediction models to create forecasts on local to global scales. Without accurate, frequent, current, and comprehensive weather observations, analyses are weak, models/predictions are inaccurate, and the value of weather information to the public and industry is reduced.

**Observing and Reporting of Weather in Antarctica:**

Meteorological Technicians have guidance in reporting the weather elements which form the subject of the World Meteorological Organization (WMO) and International Civil Aviation Organization (ICAO) coded messages for transmission. Observations are recorded in Coordinated Universal Time (UTC) worldwide. A Meteorological Technician's responsibility at SANAE is to observe the weather and package the data to disseminate to the Worldwide Weather Stations, Universities, and other Research Institutions.

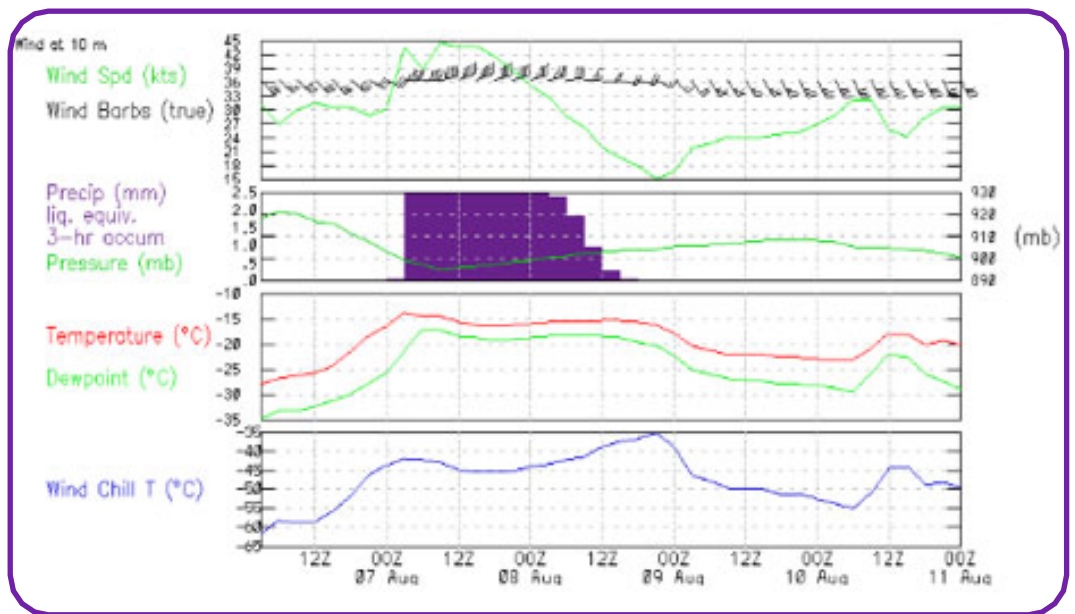
Snow, wind, hours of sunshine etc.

**dissemination/communications.**

The first element, observations, serve as the fundamental building block in the weather forecasting process.

The progress of weather observations is related directly to the rapid development of technology, a greater scientific understanding of the Earth's atmosphere and predictions. Today, weather observations are linked to environmental Earth observations, including measurements of the atmosphere, the oceans, and land surfaces.

South African Weather Service meteorologists use images from satellites circling the globe, numerical model data from the National Oceanic and Atmospheric Administration's (NOAA) National



Antarctic Mesoscale Prediction System (AMPS) model used for weather predictions in the Antarctic

We can't escape the weather, but we can prepare for it if we know what is coming. Checking the daily weather forecast is part of a regular routine for many of us, but have you ever thought about how your local meteorologist actually develops those weather forecasts?

The process of forecasting weather has four elements: **observations, analysis, prediction, and**

Centers for Environmental Prediction, real-time weather data from radars and Automatic Weather Station (AWS) units at South Africa airports to generate weather products. AWS provides 5 minute updates on vital weather information, including cloud heights, wind speed, and precipitation. This information is available to forecasters around the clock. 🗣️

# SANAE TRENDS

## Temperature

Maximum	-12.1 °C
Average Max	-21.3 °C
Average	-24.8 °C
Average Min	-28.2 °C
Minimum	-35.2 °C

## Pressure

Maximum	897.6 hPa
Average Max	881.4 hPa
Average	878.1 hPa
Average Min	874.7 hPa
Minimum	859.7 hPa

## Humidity

Maximum	100%
Average	66%
Minimum	24%

## Wind speed

Mean	22.8 Knots (45.6 km/h)
Maximum Gust	103.4 Knots (206.8 km/h)

## Daytime lengths

Average day length 4.5 hrs

## Quote of the month

Braam: "What is the expiry date on our eggs?"  
 Jako: "When they are vrot..."

Jako: "What is the length of an email address?"  
 Braam: "Depends on the length."

## Movie of the month

Underworld

## Song of the month

Whiskey in a jar - Metallica

## Dish of the month

Makrolletjies

# THANKS TO OUR SUPPORTERS:



MEERLUST





Support also by the following individuals:

Homemade Buffs – Mrs du Plessis

Homemade Ginger Biscuits – Mr and Mrs Knoesen, Mrs Bester