Winter is coming

In Antarctica this week, the daylight is dimming as the polar night approaches. “The weather is pretty changing at the moment. There are a lot of low-pressure systems coming from the Weddell Sea, leading to high wind speeds up to 55 knots and a lot of snowdrift,” says meteorologist Elena Stautzebach. She is part of a small team of early-career scientists overwintering at the German research base Neumayer-Station III. “In between, we have periods of sunny weather and temperatures around –10°C.” But the darkness will be continuous starting on 28 May. It will last 56 days.

Located 450 kilometers from its closest neighbor, the station has a proud meteorological history: Scientists have conducted measurements and observations there every 3 hours for more than 30 years. Many measurements run on a programmed schedule. But visual observations—cloud and weather conditions, air pressure, dew-point temperature, wind speed and direction, and visibility, for example—must be made by people, rather, a person. “We have just one meteorologist, who has to sleep now and then,” says the team’s lead off-continent contact, Gert König-Langlo of the Alfred Wegener Institute for Polar and Marine Research in Germany. This winter, that meteorologist is Stautzebach. The team operates on Coordinated Universal Time. At 9 a.m., noon, 3 p.m., 6 p.m., 9 p.m., and midnight, she is outside collecting data, whatever the weather.

“As it gets darker, it is getting more difficult to distinguish between different cloud layers and types. Observations are therefore taking a lot longer without daylight, as you have to stay outside longer in order to adapt your eyes to the darkness. But this also means that you have time to watch the beautiful stars of the Southern Hemisphere and that you have higher chances of seeing polar lights,” she says.

To ensure that her measurements are accurate, Stautzebach must do daily rounds, dusting snow and breaking off ice crystals from 10 radiation sensors, two ventilated temperature sensors, two wind anemometers (one of them 10 meters above the ground), three humidity sensors, and snow depth and air pressure sensors—all located 200 meters from the station to avoid wind and shadow influences. Stautzebach also climbs up on the station’s roof to check the visibility sensor and the ceilometer, which detects cloud height.

As the temperature drops, Stautzebach will start to travel 20 kilometers by snowmobile every 3 weeks to Atka Bay, where she will measure the first growth of sea ice and platelet ice. As winter digs in, the ice will become strong enough to support an automated meteorological station equipped with radiation sensors.

“Overwintering and being in charge of a scientific observatory in Antarctica is a challenge,” Stautzebach says. “During the winter season, we have to deal with all sorts of situations on our own. Our team includes one engineer who is responsible for the functioning of the entire station, one IT-specialist who has to maintain the communication with the world outside Antarctica, and one doctor. Additionally, in case of a fire, we have to turn into our own firefighters.”

Winter for the team officially started at the end of February “when the last plane left Antarctica,” Stautzebach says. “We are now on our own until November.” The nine-person team will then continue its work through the following Antarctic summer, helping the next overwintering team prepare for what is coming.

“Now that I am in Antarctica, the continent with the harshest weather conditions in the world, I can’t wait to experience probably the most extreme weather in my life. Even more exciting than cold temperatures are storm events with snowdrift and whiteouts. As soon as the highest wind speeds of a storm event are reached, I often go outside with one of my colleagues (and a radio and GPS of course) in order to experience the strength of the wind.

“This winter I will simply enjoy the harsh weather conditions in Antarctica, and as soon as I am back in Europe, I’ll think back to storm events that I had the chance to experience down here.”

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Editor's Summary

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