



UNDER ANTARCTICA

Booklet n°7 - Welcome to a scientific station

Heidi

Paco

Matthieu



Is a sledge on Santa's list?

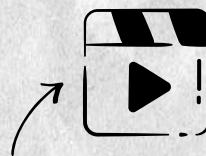
HEIDI AND MATTHIEU ALL SMILES FOR THE HOLIDAY SEASON, DESPITE A PULK THAT REMAINS AS TEMPERAMENTAL AS EVER.

“In our pulks, we had real treasures prepared by our families: cards, small gifts, and even a mini Christmas tree. Above all, a few edible wonders that did us a world of good after nearly two months of freeze-dried food: dehydrated porcini mushrooms, waffles from northern France, calissons, chocolate... a true delight for the taste buds. We took the opportunity to call our loved ones thanks to our satellite connection.”

“From the South Pole of Inaccessibility, we are gradually losing altitude. After weeks spent above 3,500 meters, breathing is now becoming easier, recovery is better, and the cold feels a little less biting.”



Heidi's second pulk also developed cracks. The first one, already damaged, was filling up with dozens of kilograms of snow every day.



Video of the first outfit change for Heidi and Matthieu

“We arrived safely at the Geographic South Pole, with a wonderful welcome and a short break. It was truly great to see people and to be able to chat and share our respective adventures!”

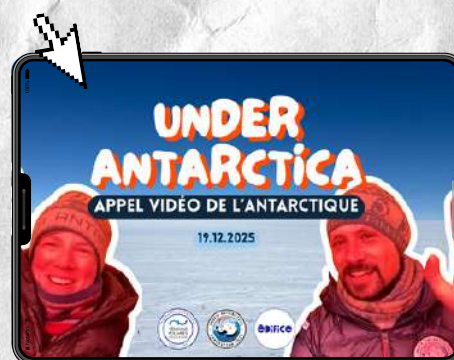
Meeting between the White Continent and thousands of young people

A VIDEO CALL FROM ANTARCTICA WITH A GLACIOLOGIST AND AN EXPLORER TO RAISE STUDENTS' AWARENESS ABOUT CLIMATE CHANGE

Last Friday, December 19, thousands of young readers of the educational workbooks had the chance to speak live with Heïdi Sevestre and Matthieu Tordeur from their expedition in Antarctica. It was the perfect moment to ask all their questions about the daily life of a scientific expedition, Antarctica, and the various topics covered in the workbooks (glacier melting, biodiversity, Antarctic history, climate change, etc.). One class even sang a song composed for the occasion.

A giant video call followed by nearly 3,500 young people from many countries around the world (France, Switzerland, New Zealand, and even Laos)!

A great boost of motivation for Heïdi and Matthieu for the rest of the expedition...



Watch the video call replay on the *Témoins Polaires* YouTube channel

Save the date : video call n°2 on 19/01/26 at 9:30AM!



Join us on Monday, January 19 at 9:30 AM for a second special video call with the Under Antarctica duo (and of course, Paco)! Like last time, Heïdi and Matthieu will answer students' questions about the different topics of their expedition, especially about the theme of the last Booklet n°8, which will be sent on 14/01/26: the Penguin Council.

Sign up now via this link and send us your question in advance.

A replay video will also be available after the call for those who cannot attend.

Guess what folks? After more than 4,000 km, we've reached our finish line!!!! Welcome to Union Glacier!

Here we are! The altitude is about 700 meters.

And by the way, this is where Heidi and I will be setting off from in a little while before heading back home.

Yes! We're leaving, but during the polar summer, some people come here to reach the summit of Mount Vinson : the highest peak in Antarctica!

Nice! But as for us, somewhere between science and sliding, we're way cooler...



Oh, it feels so good to stop.
By the way, what is Union
Glacier? Why is it so colorful
like that?

Silly you! Those are tents! Union
Glacier is a private camp set up on
the Union Glacier. It bears this name
because several glaciers meet here,
as if they were united.

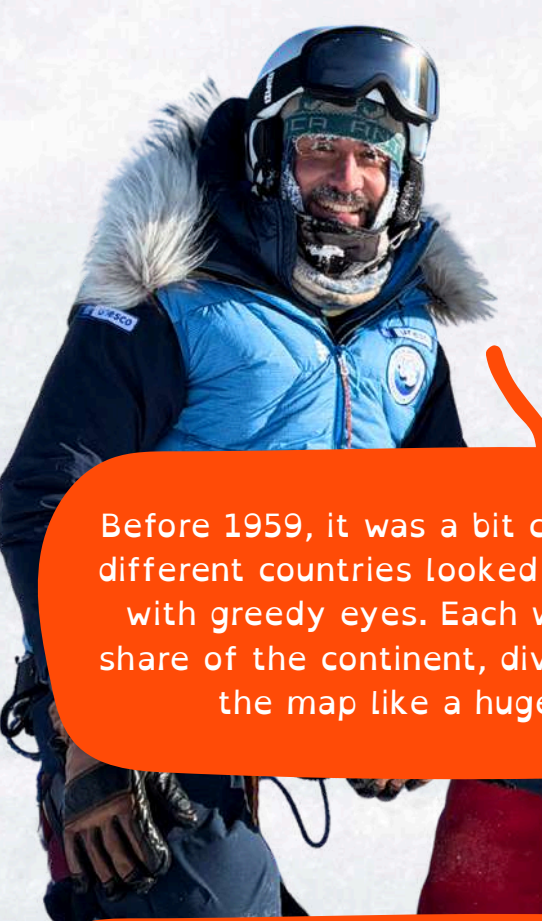
But it doesn't look like a scientific
station, does it?

No, it's a small, temporary village
that sets up every summer.
There are tents, workshops to
repair equipment, a kitchen, a
clinic... and even a landing place!
Here, you'll meet scientists,
adventurers, and tourists.

Where do they come
from? I can't wait to
meet them!

They come from all corners of
the globe! Antarctica is a unique
territory: it's the only continent
in the world that doesn't belong
to any country.

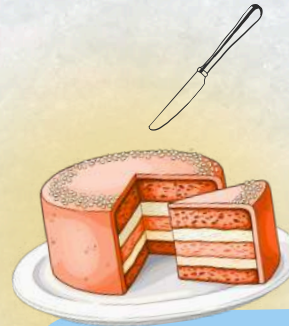




Good grief, that's amazing!
Here I thought humans
spent all their time bickering
over territories...



Before 1959, it was a bit chaotic: seven
different countries looked at Antarctica
with greedy eyes. Each wanted their
share of the continent, dividing it up on
the map like a huge cake.



Speaking of cake, I wouldn't
say no to a little snack...
Anyway, what
happened next?

The scientists pulled off an incredible
masterstroke: during the International
Geophysical Year, they showed the world
leaders that collaborating to study the
Earth was far more important than
fighting over ice.

To prevent Antarctica from becoming
a zone of conflict, the countries
listened to the scientists: the
Antarctic Treaty was signed in 1959,
a unique peace pact.

the treaty's most important principles

Antarctica doesn't belong to any country
and has become a continent of peace.

Military activities are prohibited.

Scientific research is free.

Scientific data must be shared.

Thanks to this agreement, Antarctica has become the
world's largest laboratory: the treaty laid the foundations
for long-term protection of the continent. Look!





The **International Geophysical Year** was a vast project in which 67 countries decided to work together more closely in order to better understand our planet. They conducted studies on the oceans, weather, ice, the Earth, and even space!

1957-1958

Did you know that 2025 is the International Year of Glacier Preservation?

1959

One year later, countries were encouraged by the results of the previous year and therefore signed the famous Antarctic Treaty. They decided to turn this continent into a land of peace and cooperation to advance science.



1991

Later, the **Madrid Protocol** made it possible to recognize Antarctica as an important natural reserve that must be protected. It also prohibited the exploration and extraction of resources in the region!



2016

Finally, in 2016, an agreement was reached among the member countries of the CCAMLR. As a result, **the Ross Sea** became the largest marine protected area in the world (roughly twice the size of Spain).

Pssst! CCAMLR stands for the Commission for the Conservation of Antarctic Marine Living Resources, established in 1982.



Today, there are no cities in Antarctica, but more than 80 scientific research stations. They are all equipped so that scientists can sleep, eat, receive medical care, work, and even relax. Here are a few of them!



Esperanza



It is the only permanent Antarctic station where babies have been born, and the first base to have organized an international football tournament!



Halley vi



This base is located on a floating ice platform 150 meters thick, which drifts 400 meters toward the sea each year.



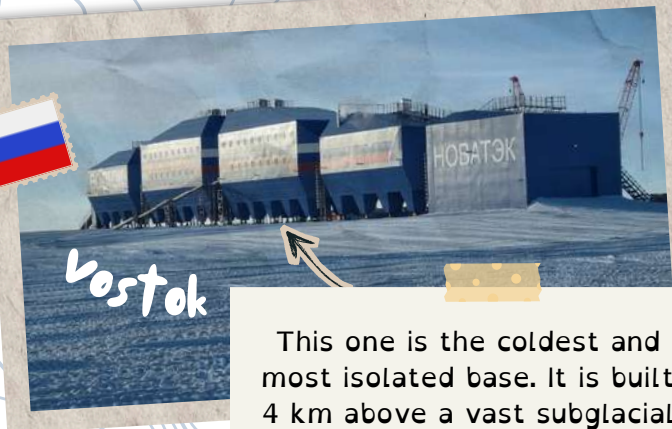
Concordia



This one is located at about 3,200 meters above sea level, making it one of the most isolated stations on the continent!



Vostok



This one is the coldest and most isolated base. It is built 4 km above a vast subglacial lake, Lake Vostok.

Neumayer



This base hosts an experimental greenhouse that allows its inhabitants to have fresh vegetables!



Qinling



Finally, here is the newest base in Antarctica, officially opened in 2024.

Your turn!



Imagine and design your own scientific station in Antarctica: choose its location, shape, colors, and technologies, give it a name, and explain why it is special. Make sure it can withstand wind, cold, and snow while allowing scientists to work efficiently!

In Antarctica, there is neither diesel nor supermarkets. Everything is brought from other countries by ship, plane, or overland convoys. Several deliveries are needed each year to supply the bases with food, equipment, and fuel.

1

The French-Italian Concordia Station is supplied through large overland convoys from another base. Tracked vehicles, sleds, and even containers move in a single file across the ice.



2

The Dumont d'Urville Station is supplied by the icebreaker L'Astrolabe, a ship of the French Navy. Its hull is reinforced to navigate through the sea ice.

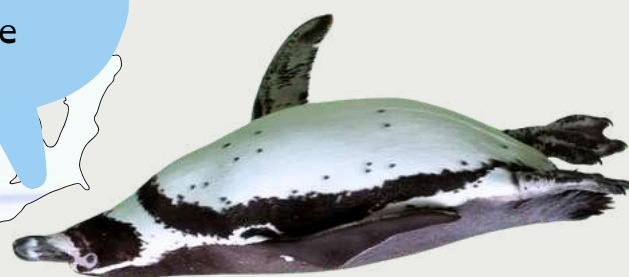


3

The LC-130 aircraft supplies the American McMurdo and Amundsen-Scott stations. It can land on snow and ice thanks to large skis attached to its wheels.



What an operation... I'm exhausted just thinking about it. I'm going to take a little walk!



But it's like a real summer camp here! Hello there, I'm Paco, an intern in glaciology for the Under Antarctica expedition!

You almost even smell good! Because my two humans over there have been wearing the same T-shirt for weeks... I won't even tell you about the smell. What are you doing here, and most importantly, how are you?



Oh look, such a cute penguin!

We pass through here either to go back home or to reach our scientific base. We don't live here year-round. We come from many different countries and all have different jobs.

You might think we get bored here, but between the storms, the **southern lights**, and the missions, every day is different!

We live far from our families. Our base is both our home and our workplace. Sometimes, we don't see the sun for months and can't go outside whenever we want: it's a real adventure.

I'm the cook! Cooking without fresh vegetables for months is a real challenge!

I do weather analysis!

I'm the doctor!

I take care of checking the equipment to prepare for trips out on the ice.



What language do people speak in Antarctica when they come from different countries? Is there some kind of "Antarctican" language?

"Hello" would be said as "Brrrr"...

No, little ball of feathers, "Antarctican" doesn't exist... but nothing stops you from inventing it! To make communication easier, scientists now mostly speak **English** to share their discoveries with the whole world. In fact, here, international teams join forces to understand our planet.

Remember that we can study past climates thanks to ice layers?

Imagine this: at over 3,200 meters above sea level, more than 1,000 km from the coast, with average temperatures of -35°C , scientists from all over the world drill into the ice to collect **ice cores**.

That's what scientific collaboration looks like!

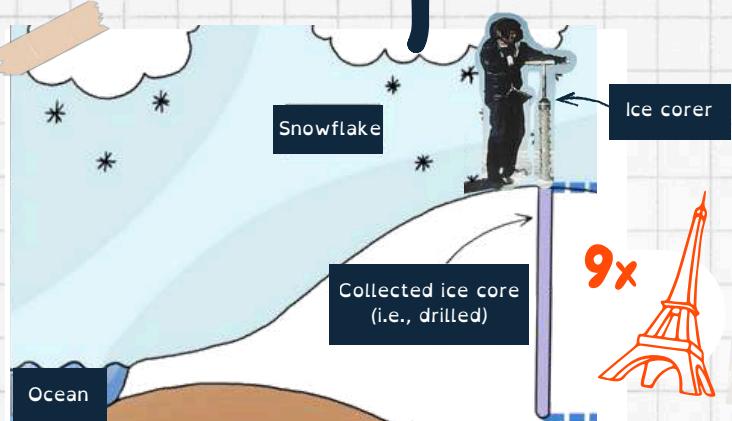
Beyond EPICA
An international project: 10 countries

Objective :

- ★ Studying Earth's past climates
 - * Temperature
 - * Amount of greenhouse gases
 - * Chemical elements

How?

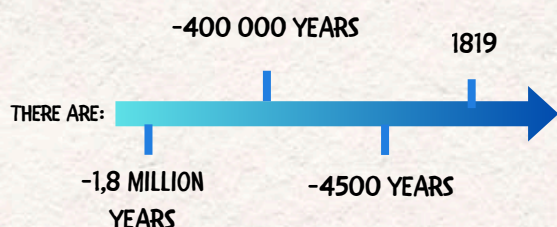
- Ice core analysis
- Analysis of air bubbles and impurities trapped in ancient ice



In 2025, scientists drilled down to 2,800 meters! This allowed them to uncover 1,200,000 years of Earth's history.

I hope no one fell into that hole!

Place the following events from oldest to most recent:



A - Discovery of Antarctica



B - The first humans (Homo erectus) leave Africa



C - Mastery of fire



D - Mammoths' extinction

How can they be sure of their results? Anyone can make mistakes, right?



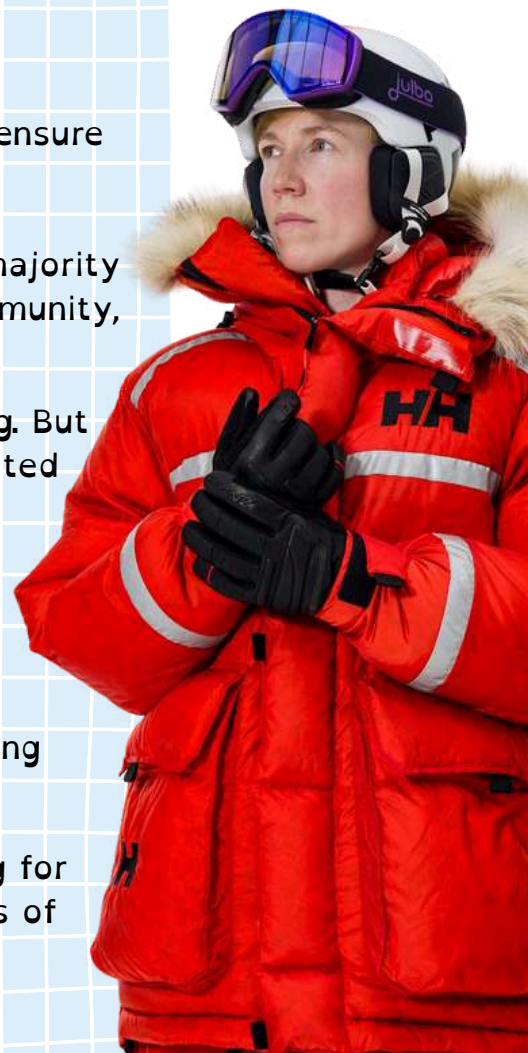
When I do science, I start by **observing** or asking a question. I propose a **hypothesis** to answer it, then test it through **experiments**, models, or simulations. I share my results with other researchers **so they can check them**. If my conclusions hold up to their critiques, they become more reliable. And even if everything doesn't work the first time, each step helps advance understanding.

Science is not an opinion

- ✿ Science is not based on opinions or impressions, but on a rigorous **scientific method**.
- ✿ Scientific research goes through a long process to ensure that the results are accurate.
- ✿ We talk about **scientific consensus** when the vast majority of scientists, based on research validated by the community, agree on a point.
- ✿ Science does not exclude **doubt**; it welcomes questioning. But doubt should not outweigh the abundance of accumulated evidence.

Science is constantly evolving

- ✿ It only takes a single contradictory observation to invalidate a hypothesis. Science progresses by correcting and refining its knowledge.
- ✿ Science evolves with technological advances, allowing for new observations or the processing of large amounts of data.



That's thanks to the Antarctic Treaty, right?

Antarctica is a fantastic example that science can unite nations. Despite geopolitical tensions in the world, this continent remains **a model of peace, cooperation, and hope!**

Exactly! Despite that, disputes persisted even after the treaty was signed.

In the 1970s and 1980s, Argentina and Chile, which claimed the same territories, even sent pregnant women to Antarctica to give birth there, hoping to strengthen their territorial claims. Today, these two countries collaborate on scientific projects.

Here, there's no room for coldness between nations; it's cooperation that melts tensions!

Did you know that?

Space, like Antarctica, is still somewhat beyond major earthly rivalries.

Even today, European, American, and Russian astronauts come together aboard the International Space Station, sharing the same rocket and mission despite geopolitical tensions.

Couldn't we use this model to fight climate change together?

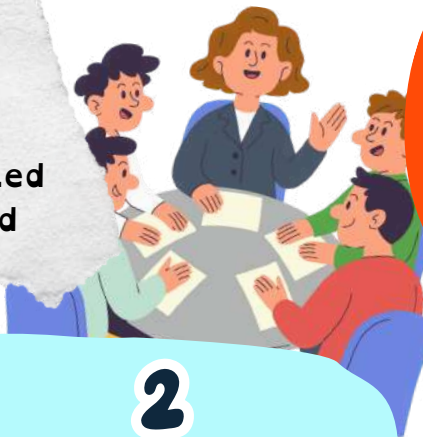




At the global level, there is an important group: the **IPCC** (Intergovernmental Panel on Climate Change). It brings together thousands of scientific experts, divided into **three working groups**, each addressing a specific question, to synthesize all knowledge on climate change. Its rigorous reports can guide countries' climate policies.

ipcc

34,000 scientific articles cited
130 countries represented



Since 1988

Intergovernmental
Panel
on **C**limate
Change

1

"Why is the climate changing?"

Today, there is a clear scientific consensus: the current climate change is linked to human activities.

2

"What are the risks for populations, and how can we adapt?"

The climate is changing everywhere, but not in the same way: the consequences vary by region.

3


"How can we reduce greenhouse gas emissions?"

Nothing is decided! Solutions exist; they must be implemented at all levels: both individual and collective.

In 2007, the IPCC even received **the Nobel Peace Prize** for its key role in spreading knowledge about climate change and the measures needed to address it. Yet, despite the scientific evidence, world leaders struggle to agree on swift and concrete actions.



We need to make ourselves heard at the Penguin Council then! Maybe I'll get a prize there too.



That's it, the sports adventure is over!
So many memories, moments that will
be forever engraved in my mind. Let's
enjoy this unique landscape together
one last time!

Are you crying,
Paco?

No, no, it's the wind drying
my eyes, I swear... Can I ask
you one last question?

Of course
buddy.

Can you come with me
to the Penguin Council?

To be continued...

Hi there, my little friends!

Last note before the Penguin Council next week...
and the stress is starting to rise!

This week, I discovered that Antarctica, thanks to the Treaty that protects it,
is a model of peace and scientific collaboration. Some scientists even spend
several months in the stations, and their rigorous research can be used by the
IPCC to write their climate reports.

This adventure has been incredibly enriching. I must admit I'm going to shed a
few tears.. I'm going to miss the snoring of those two crazy humans.

See you at the Penguin Council!
Give me strength,
See you soon

Paco
Trainee glaciologist

"What kind of Antarctic scientist are you?"

As you know, there are many different jobs at scientific bases.
Discover the one you would most like to do!

For each question, choose the answer that suits you best. Each answer corresponds to a symbol (● ▲ ■ ★). At the end, count which symbol you got the most, and discover your job! If there's a tie, choose the job from the two tied symbols.



What do you prefer to observe?

- The shape of glaciers and their speed: ●
- The wind, clouds, and storms: ★
- The waves and ocean currents: ■
- The penguins, seals...: ▲

Which sound do you like the most?

- The cracking of a glacier → ●
- The blowing of the wind → ★
- The sound of waves under the ice → ■
- The cries of a penguin colony → ▲

Which tool would you most like to use?

- An ice corer to drill into the ice → ●
- A weather station for measuring temperature → ★
- An oceanographic probe → ■
- An animal observation notebook → ▲

What is your best quality?

- Patient → ●
- Observant → ★
- Curious about hidden movements → ■
- Gentle with animals → ▲

What would you most like to discover?

- A layer of ice never studied → ●
- A rare weather phenomenon → ★
- A hidden ocean current → ■
- A species in the cold waters → ▲

if you have...

A MAJORITY ● : YOU ARE A GLACIOLOGIST

Like Heïdi (and Paco), you love glaciers and their secrets: you decipher Earth's past by analyzing the layers of ice!



A MAJORITY ★ :

YOU ARE A CLIMATOLOGIST OR METEOROLOGIST

You read the sky, the wind, and the weather like no one else. You predict and explain what's happening in relation to the climate or weather!



A MAJORITY ■ : YOU ARE AN OCEANOGRAPHER

You want to understand what lies beneath the Southern Ocean and how it warms or cools the glaciers.



A MAJORITY ▲ :

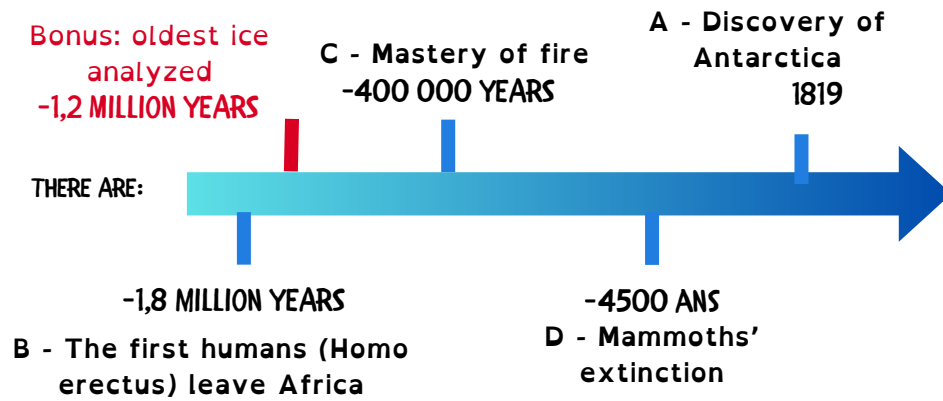
YOU ARE A BIOLOGIST OR ECOLOGIST

Animals are your friends, and you want to protect their lives and habitats in extreme conditions.



GAMES SOLUTIONS

Page 11



images to cut out



ipcc



Lexicon

D

Dispute: Exchange of hostile remarks or major disagreements; synonym for conflict or quarrel.

G

Geophysics: The science that studies the physical properties of the Earth (such as its structure, earthquakes, magnetic field, or climate) using physical and mathematical methods.

Geopolitics: The study of relations between countries, how they form alliances, dispute territories, or share resources.

I

Ice core: Cylindrical tube taken from glaciers or ice sheets, allowing scientists to reconstruct climate and atmospheric composition over hundreds of thousands of years. The core is extracted using an ice corer.

N

Nobel Prize: An international award established in 1901 that honors individuals or organizations each year for exceptional contributions in peace, literature, science, and economics.

R

Resource: A natural element that humans exploit to produce energy, make objects, or meet their needs, such as oil, minerals, or water.

S

Subglacial lake: A liquid water lake located beneath a thick ice layer, often trapped for thousands or even millions of years. These lakes remain liquid due to the pressure of the ice above, geothermal heat from the Earth, and sometimes the thermal insulation of the ice sheet. Lake Vostok is the largest, roughly the size of Corsica.

Synthesize: To summarize or condense the main ideas of a text, study, or speech, keeping only the essential points clearly and concisely. The IPCC synthesized all scientific knowledge on climate change in several stages, based on 34,000 articles, producing reports ranging from 3,949 pages to a 42-page summary.

To go further



24 hours with the scientists at the French-Italian Concordia Station



Geopolitical issues in the Arctic and Antarctic

Secret password :



Weddell Sea

