



ANTARCTICA: THE LAST WILDERNESS

UNDERSTANDING GLOBAL ISSUES

Introduction

Antarctica, one of Earth's continents, is the most inhospitable environment in the world. There are no farms, no forests, and no trees of any kind. The weather is colder, drier, and windier than anywhere on Earth. Thick sheets of ice cover 98 percent of the land. Bare rock makes up the remaining two percent. Antarctica boasts the world record for lowest temperature. In 1983, a temperature of -129°F (-89.2°C) was recorded at

Vostok, a Russian research station on the continent. Why, then, does this desolate place attract such international interest and concern?

Antarctica has no **indigenous** human population. The only people who live there are researchers from different countries, and most of them live there only semi-permanently. Though many countries have laid claim to it, Antarctica belongs to no one. In a sense, the fifth-largest continent on

Earth belongs to everyone.

Since Antarctic exploration began, seven nations have laid formal claims to portions of the continent and the waters and islands surrounding it: Argentina, Australia, Chile, France, New Zealand, Norway, and the United Kingdom. Many of these claims overlap. In the 1950s, at the height of the **Cold War**, the potential for conflict over territorial claims in Antarctica, particularly between the United States and the Soviet



Union, began to cause serious concern. The tension was defused by a diplomatic solution—the Antarctic **Treaty**. Signed in 1959, this treaty became effective in 1961. The seven claimant nations, as well as Belgium, Japan, South Africa, Russia (then known as the Soviet Union), and the U.S., agreed to treat Antarctica as a zone to be used purely for scientific research and cooperation. Military use of the continent was banned, and territorial claims have been put on hold indefinitely.

The Antarctic Treaty, along with several agreements that later accompanied it, represents a major step forward in protecting

Earth’s “last wilderness.” The most recent of these, the **Protocol on Environmental Protection to the Antarctic Treaty** (also known as the Environmental Protocol to the Antarctic Treaty, or the Madrid Protocol) was signed in 1991.

Antarctica offers a window on the past, present, and future of our planet.

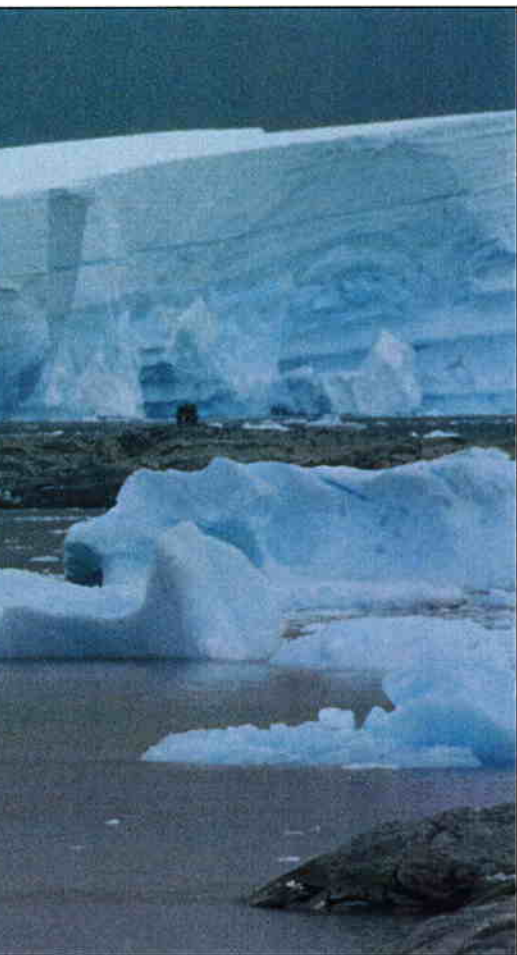
Signing of the protocol was a great victory for those concerned with protecting the environment and through it, the planet. By banning commercial mining activities and introducing strict environmental regulations, the protocol has strengthened Antarctica’s status as a natural reserve for peace and science. Even so, there are weaknesses in the treaty system. All diplomatic decisions are based on **consensus**. Thus, a single country can veto any proposal that it finds unacceptable. In addition, the treaty system lacks a permanent monitoring body. Instead, decisions are made at annual meetings held in different locations throughout the world.

As with any international treaty, successful implementation depends on the willingness of governments to enforce regulations over their own nationals. Without an

independent monitoring body, effective enforcement is difficult. The situation is further complicated by the remoteness and climate of Antarctica, and the lack of a large and permanent population to “blow the whistle” on those who ignore or defy treaty agreements.

There are other difficulties as well. Some countries with an established presence in Antarctica still have not signed the Environmental Protocol. Overfishing in Antarctic waters, which has plagued the region for nearly 200 years, remains a problem. Baited fishing nets are killing seabirds by the thousands. Each Antarctic spring, a “hole” opens in the **ozone** layer over the South Pole. As a result, temperatures are increasing. This may be causing ice shelves to crumble, and could be an indication of global warming. Antarctic sea currents, which affect sea currents throughout the world, also appear to be changing. Tourism is increasing, and with it the potential for local environmental damage.

The Antarctic **ecosystem** is very fragile. Until the 1800s, the continent knew nothing of humans, or their often-punishing impact on the environment. As the world’s last unspoiled wilderness, Antarctica offers a unique window on the past, present, and future of our planet. The health of the “white continent” both affects and serves as a barometer for the health of the rest of the planet.



Antarctica, the planet’s last wilderness, is a fragile environment at risk due to human activity.



This old, rusting whaling ship at Grytviken, South Georgia, serves as a reminder of Antarctica's once-flourishing whaling industry.

KEY CONCEPTS

Antarctic Circle The Antarctic Circle is the name given to the 66°30' S parallel of latitude. South of this latitude, the sun never rises on the "summer" solstice (around June 21), and it never sets on the "winter" solstice (around December 21). Periods of continuous day or night increase the closer one gets to the South Pole, from one day at the Antarctic Circle to six months at the Pole.

Scientific Committee on Antarctic Research (SCAR)

SCAR was formed in 1958 to

continue the scientific cooperation established during the International Geophysical Year (IGY) of 1957/1958. This committee is not formally recognized as being part of the Antarctic Treaty System (ATS). Even so, SCAR is the principal provider of independent technical advice to meetings of the Consultative Parties. In effect, it acts as the scientific coordinating body for the treaty.

SCAR also works with the International Council of Scientific

Unions to coordinate polar-related projects that have global significance. SCAR holds the world's largest collection of aerial photographs of Antarctica.

Season reversal As Earth's axis tilts toward the sun, the climate becomes warmer. Similarly, as Earth's axis tilts away from the sun, the climate cools. As a result, the seasons are reversed in the Southern Hemisphere. So, while it is winter in the Northern Hemisphere, it is summer in the Southern Hemisphere.



Though scenic, Antarctica presents many challenges for those who choose to visit, work, or live there.

ivers of ice flow through the ice sheets, drawing some ice along with them and carrying it out to the ocean. The result is ice shelves—floating expanses of ice that remain attached to the land. The East Antarctic ice sheet covers an area of 3,844,000 square miles (10,000,000 sq km)—about the size of Australia. The smaller West Antarctic ice

sheet comprises an area one-fifth of that. Together, these ice sheets contain roughly 90 percent of Earth's ice.

Katabatic winds Complex patterns of air movement and temperature change create winds that blow down the mountains and coastal **escarpments** of Antarctica. Impelled further by

gravity, these downward-flowing winds can surge toward the sea at ferocious speeds. They are called katabatic winds (katabatic means “to go down”). While not unique to Antarctica, they are one of its distinctive weather features.

It is estimated that global temperatures have risen by 0.8 to 1.0 °F (0.45–0.6 °C) over the last century. The last decade of the 20th century was the hottest on record. Not surprisingly, global ice melting was recorded in more places and at greater rates during this same decade. Meanwhile, the mean global sea level has risen six to eight

inches (10–20 cm) over the last 100 years. This may seem like a small amount. It is, however, greater than the rate of increase over the past several thousand years.

Since Antarctica stores so much of Earth's freshwater, scientists are watching its frozen banks intently. Currently, only two areas of the continent show

clear climate-related trends. One is the Antarctic Peninsula, where large-scale melting is occurring. The other is in the atmosphere, high above the tallest mainland mountain peaks. There, the annual return of the ozone hole is a worrisome reminder of environmental threats.

WHAT IF THE ICE MELTS?

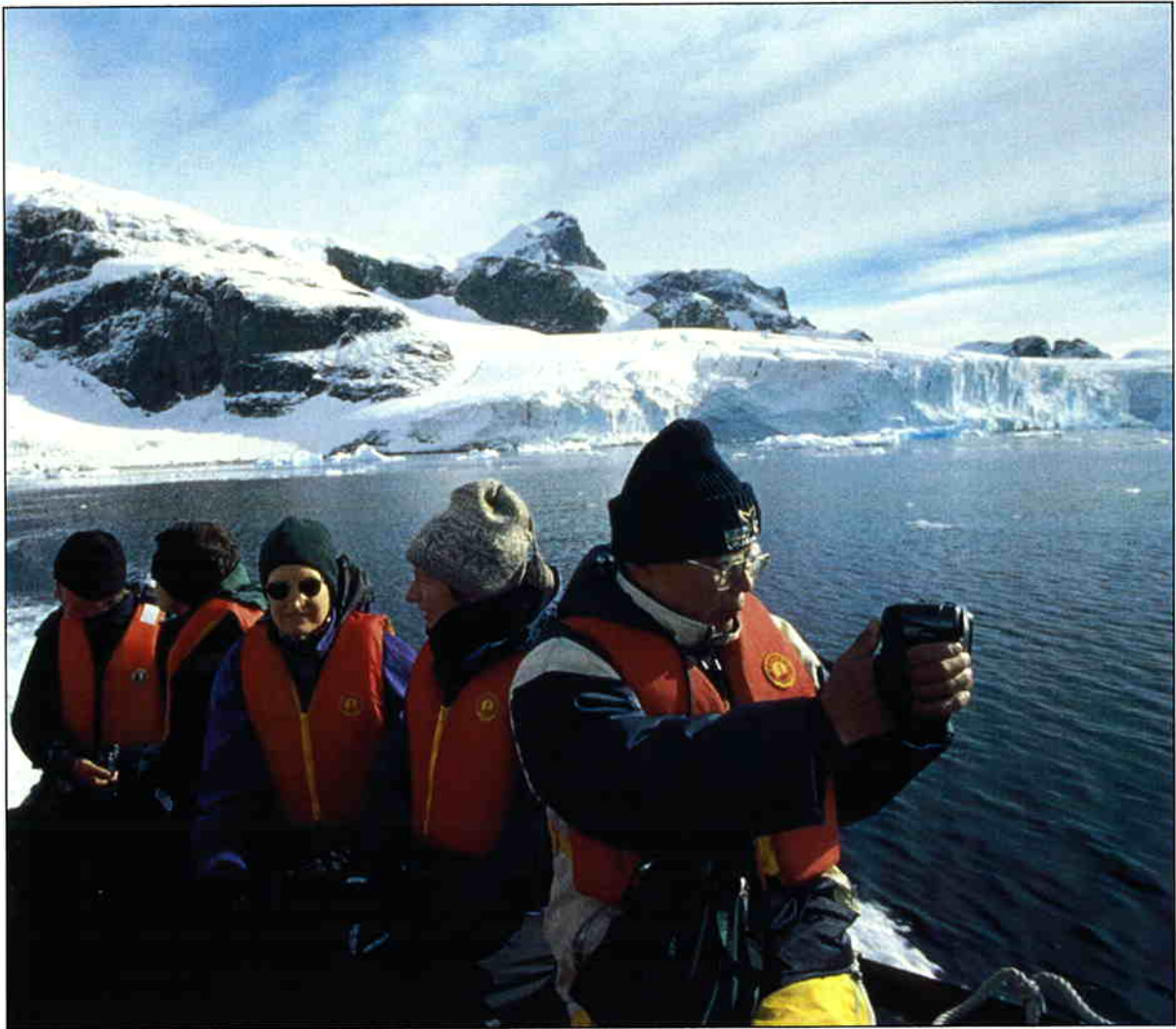
Much confusion surrounds concerns about global warming and the melting of Earth's polar ice, especially Antarctic ice. Melting of ice shelves would have little direct impact on sea levels, because ice shelves are floating in the ocean. The volume of water they already displace would be equal to the volume of water that would result if they melted. The same is true of icebergs, pack ice, and Arctic ice, which are already free-floating. However, the destruction of Antarctica's ice shelves allows inland ice sheets to flow more quickly and freely to the sea. This "new ice" would displace water and cause sea levels to rise.

In theory, a total melting of the Antarctic ice sheets would raise sea levels about 200 feet (60 m). Such an increase would result in coastal flooding on a global scale. Many of the world's cities and islands also would disappear beneath the rising oceans. Fortunately, the likelihood of this happening is remote. Because it is so cold in the south polar region, melting of the Antarctic ice sheets would require a global temperature increase far in excess of the temperature increases that are currently forecast. In addition, if all this ice were to melt, the process would take hundreds, if not thousands, of years. This knowledge should not, however, downplay the impact that smaller-scale increases in sea levels would have on coastal areas and islands. Although scientists lack certainty about many of the factors related to global warming, most evidence indicates that global warming is likely to affect Antarctica. The projected effects of global warming on temperatures, sea levels, surface vegetation, and human populations are dire enough to warrant concern from everyone.

Antarctica's pack ice can extend between 1 million and 7.3 million square miles (1.6 million–11.7 million sq km), depending on the season.







Most tourists begin their Antarctic vacations in South America, where they board cruise ships that take them to their exotic destination. “Adventure” trips involving climbing and kayaking are also becoming popular.

Since tourism began in earnest in the 1980s, increasing numbers of people have been going ashore. The 1999/2000 tourist season was the most successful to date. About 15,000 people came to view the scenery, wildlife, and historic sites. Numbers dropped by several thousand between 2000 and 2002. Nevertheless, tourism is viewed as a growing industry,

having seen a significant overall increase throughout the 1990s.

Most tourists arrive on cruise ships, although yachts have also appeared in recent years. Many factors affect the expense of a vacation “on the Ice.” Costs generally range from as low as \$3,000 to \$15,000 or more.

Another “cost” of tourism is the possibility of environmental damage. Fortunately, the

Environmental Protocol also applies to tourists. The International Association of Antarctic Tour Operators (IAATO) requires compliance with the spirit and letter of the protocol. Thus, visitors must not disturb wildlife in any way. Visitors also cannot smoke, leave litter, or wander into protected areas. Research stations are also restricted areas.