

The International Polar Year (IPY) 2007-2008

Hugo Decler

(President Belgian National Committee for Antarctic Research)



The International Polar Year (IPY) 1882-1883

- The need for the establishment of a network of geophysical observatories in the Polar regions was raised at the Meeting of German Naturalists and Physicians in Leipzig in 1872 and later elaborated at the meeting of the Royal Geographical Society in London in 1875 by Carl Weyprecht.
- Co-leader of the Austro-Hungarian North Pole Expedition of 1872-74
- Discovered Franz Josef Land in 1873 while their ship the 'Tegetthof' was beset by the ice. Later, the whole expedition crew abandoned ship and returned over the pack ice to Novaya Zemlya.

The International Polar Year (IPY) 1882-1883

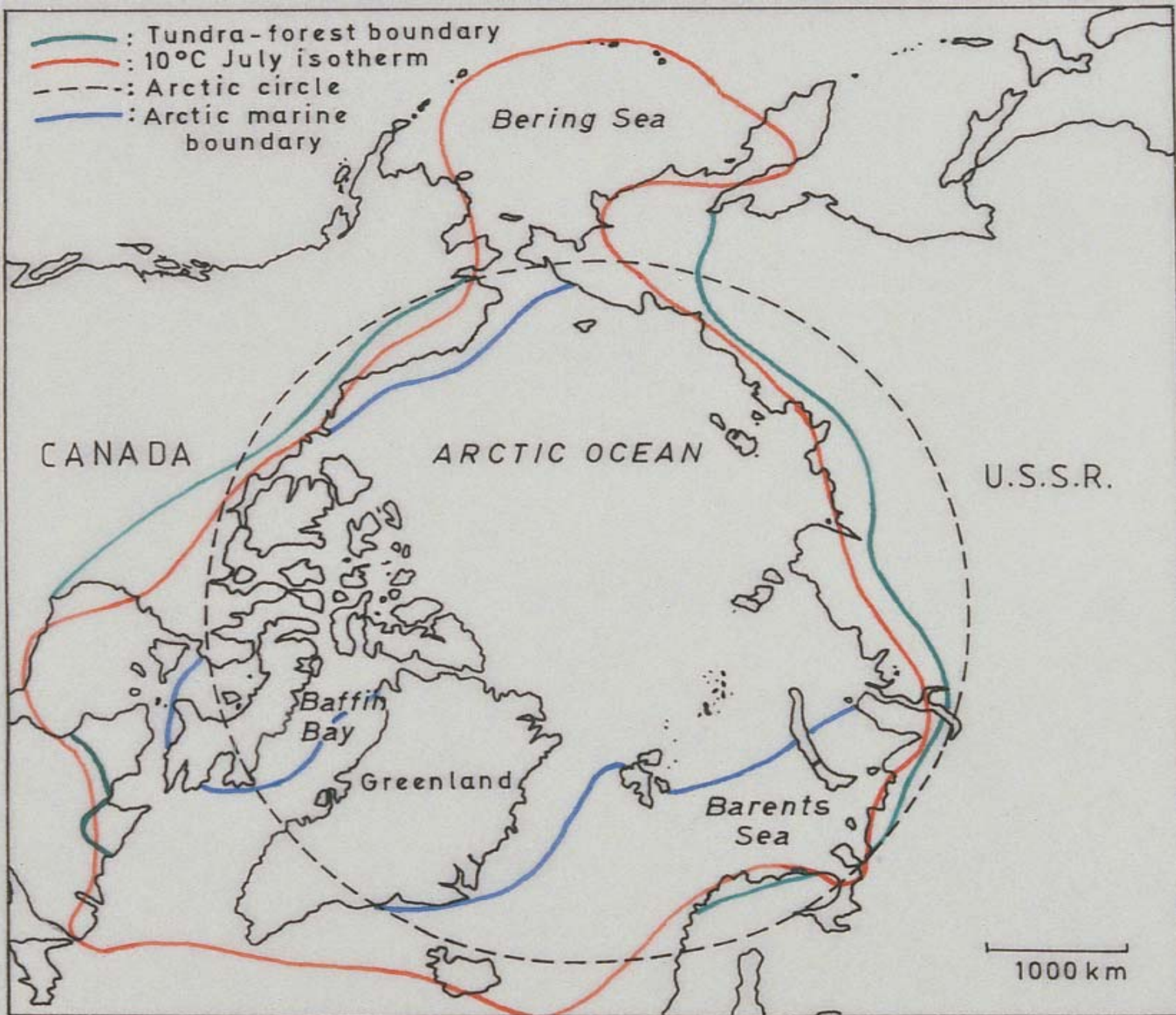
- **“...The key to many secrets of Nature is certainly to be sought for near the Poles...”**
- **“...But as long as Polar expeditions are looked on merely as a sort of international steeple-chase, which is primarily to confer honour upon this flag or the other, and their main object is to exceed by a few miles the latitude reached by a predecessor, these mysteries will remain unsolved...”**
- **“...Decisive scientific results can only be attained through a series of synchronous expeditions, whose task it would be to distribute themselves over the Arctic regions and to obtain one year’s series of observations made according to the same method...”**

The International Polar Year 1882-83

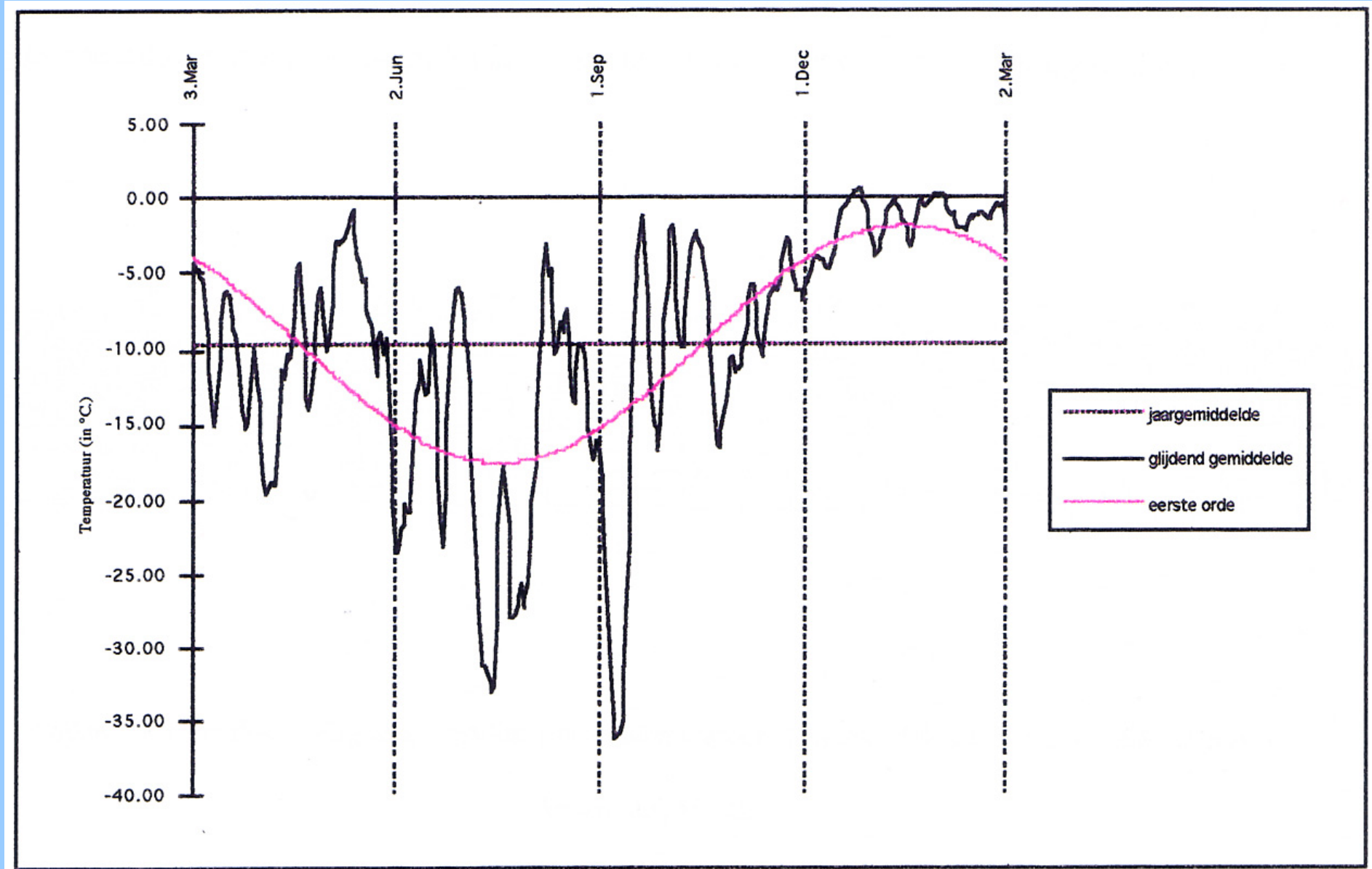
- At the occasion of the Transit of Venus
- Thanks to the high sunspot activity the relationship between aurora's and geomagnetism could be established
- 11 nations established 12 circumpolar stations in the Arctic
- 2 nations established stations in the South: France at cape Horn, Germany in South Georgia
- Results mainly in the domain of geomagnetism and meteorology

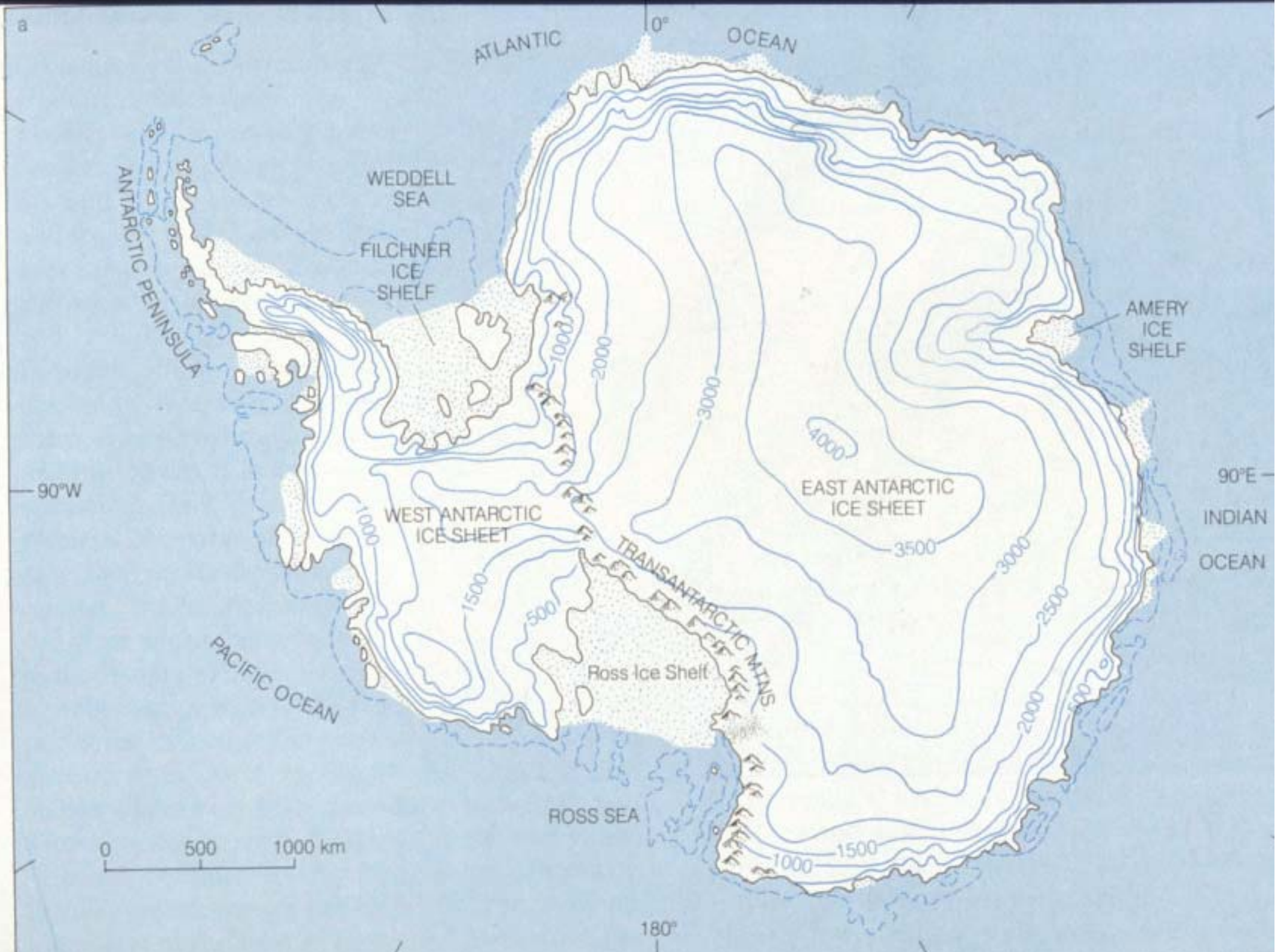
The International Polar Year (IPY) 1882-1883

P. Barrow	- 12.9	15.8	- 47.0
Ft. Rae	- 06.1	25.6	- 44.6
Kinguafjord	- 11.4	19.7	- 48.1
Ft. Conger	- 19.3	11.3	- 49.2
Godthaab	- 03.0	14.9	- 24.2
Jan Mayen	- 02.3	09.0	- 30.6
Bossekop	+ 01.5	26.3	- 21.7
Svalbaard	- 06.2	13.6	- 35.5
Sodankylä	- 00.6	25.2	- 37.7
N. Zemlya	- 06.6	15.7	- 39.5
Kara Sea	- 11.2	09.6	- 47.2
<small>13/07/2006</small> Sagastyr	- 17.5	12.8	- 53.2



'Belgica' temperature series (1898)





The International Polar Year 1932-1933

- 50th anniversary of IPY 1882-83
- More than 40 nations participating
- Meteorology and upper atmosphere (Geomagnetism, ionosphere, aurora, electricity...)
- Limited observations in the Southern hemisphere

The International Geophysical Year (IGY) 1958

- IPY of 1982-83 moved up to 1958 as IGY
- Idea arose from one of the participants of the 1932-33 IPY, Sydney Chapman.
- Special Committee of the IGY led by Chapman (President) and Marcel Nicolet (Belgium, Secretary-General).

Scientific assault on the planet earth

- all scientific disciplines
- including solar-terrestrial relationship
- during a maximum of the 11-year solar cycle
- including space research: launch of Sputnik
- global coverage of the planet
- 64 countries and 4 000 stations

The International Geophysical Year (IGY) 1958

- Scientific assault on Antarctica
- 55 scientific stations including one at the South Pole (USA), one at the center of the East Antarctic ice cap (Russia)
- Base Roi Baudouin established on a floating ice shelf in Dronning Maud Land
- Start of big logistic operations in Antarctica: ice breakers, air planes (ski equipped C-130), snow tractors

International Geophysical Year 1958

- Impressive legacy
- Observational period covering a complete solar cycle (International Year of the Quiet Sun, IQSY IN 1964)
- Network of permanent observatories
- International collaboration: SCAR (Scientific Committee on Antarctic Research) and Antarctic Treaty

International Geophysical Year 1958

- Start of the 'space age' including satellite applications
- Antarctic weather data used for weather forecasting in the Southern hemisphere
- Stratospheric structure and ozone layer (minimal thickness in Spring)
- Upper atmosphere structure thanks to conjugate point measurements

International Geophysical Year 1958

- Importance of ice cap: 91 % of the ice is stored in Antarctica while the ice represents 78% of all fresh water on earth
- Recognition of the main geological provinces in Antarctica
- Crustal structure
- Outlook on possible mineral exploitation
- Biology and oceanography not explicitly included in IGY program but boosted thanks to availability of platforms (ships and stations)

International Polar Year 2007-2008

- Initiative of ICSU (cfr. IGY)
- 50th anniversary of highly successful IGY
- Concept: intensive burst of internationally coordinated, interdisciplinary, scientific research and observations focused on the earth's high latitudes.
- Official observing period: 1 March 2007 – 1 March 2009 (2 Arctic and Antarctic summers)

International Polar Year 2007-2008

Research Themes

- Status: to determine the present environmental status of the Polar regions
- Change: to quantify, and understand, past and present natural environmental and social change in the polar regions; and to improve projections of future change.
- Global linkages: to advance understanding on all scales of the links and interactions between polar regions and the rest of the globe, and of the processes controlling these.

IGY (1958)	IPY (2007-2008)
Many new stations	High tech stations
Geophysics Solar terrestrial	Environment Global warming
Biology and oceanography not specifically included	Oceans linking the poles Biodiversity and microbiology
Exploration geology	Plate tectonics + evolution
Exploring the pristine environment	Conserving the pristine environment
Surface characteristics, mapping	Deep ocean and subglacial environment
Establishing a political regime (ATCM)	Establishing a management regime (CEP)
Ship based operations	Aerial network
	Education, outreach and communication
<small>13/07/2006</small> National operations	International operations + interdisciplinary

International Polar Year 2007-2008

Research Themes

- New Frontiers: to investigate the frontiers of science in the polar regions.
- Vantage Point: to use the unique vantage point of the polar regions to develop and enhance observatories from the interior of the earth to the sun and the cosmos beyond.
- Human dimension: to investigate the cultural, historical, and social processes that shape the sustainability of circumpolar human societies and to identify their unique contributions to global cultural diversity and citizenship.

IPY 2007-2008

- Worldwide more than 400 full proposals came out from more than 1000 expressions of intents (ideas)
- In about 30 proposals there is Belgian involvement. There are four proposals where Belgians have a lead or co-lead function
- It is expected that about 250 proposals will obtain an official IPY status