



Mario Zucchelli

Programma Nazionale di Ricerche in Antartide

74°41'42''S 164°7'23''E

Type: Station

Operational period:
October–February

Location

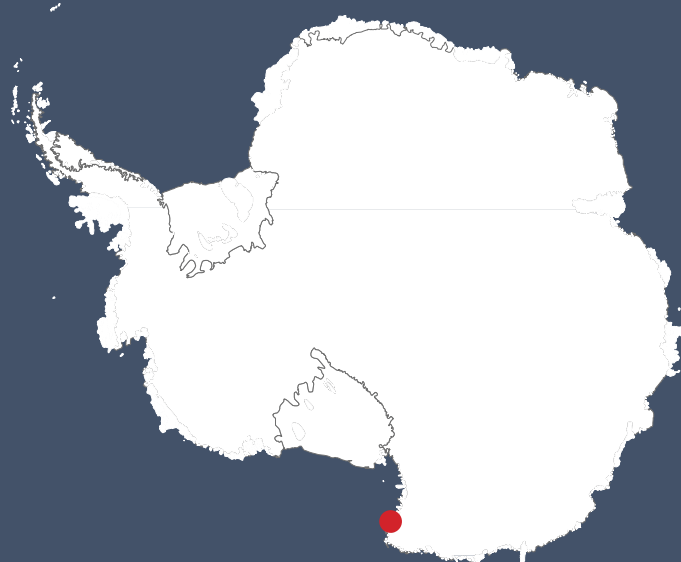
Mario Zucchelli station (MZS) is located in the Ross Sea area, in the Victoria Land, at the foot of small range called Northern Foothills. MZS is a coastal station built on a granite promontory overlooking the Gerlache Inlet, within the wider Terra Nova Bay.

Biodiversity and natural environment

MZS is located in the Northern Foothills, an ice-marginal, high latitude periglacial environment covered only by local glaciers and snowfields. The area, characterized by Adélie and Emperor penguin colonies and Skua colonies (at Edmonson Point, Cape Washington, Adélie Cove and Inexpressible Island), hosts some marine and terrestrial protected areas (ASPA161, 118 and 173). The fauna comprises also other species of seabirds (Snow and Wilson's Storm petrel), seals (Leopard and Weddell seal) and whales (Killer, Antarctic minke and Arnoux's beaked whale). Furthermore Wood Bay and Terra Nova Bay are among the most biologically and ecologically diverse areas in Antarctica with many species of bryophytes, lichens, algae, cyanobacteria and invertebrates. The vegetation of Victoria Land is entirely cryptogamic and vascular plants are absent.



CLIMATE	
Climate zone	Coastal Antarctica
Permafrost	Continuous
Mean annual wind speed (km/h)	22
Max wind speed (km/h)	243
Dominant wind direction	W
Sea Ice Break Up	December
Snow free period	January, December
Total annual precipitation (mm)	
Precipitation type	Snow
Mean annual temperature (°C)	-14
Mean temperature in February (°C)	-7
Mean temperature in July (°C)	-22
ENVIRONMENT	
Region	Continental Antarctica
Antarctic Environmental Domain: U – North Victoria Land geologic	
Antarctic Conservation Biogeographic Region: 8 North Victoria Land	
Altitude of facility (m)	15
Type of surface facility built on	Ice-free ground
Long term monitoring	Yes
Waste management	Yes
Hazard(ous) management	Yes
Fuel spill response capability	Yes



History and facilities

The site for the permanent Italian station, built in 1986, is Terra Nova Bay between Cape Washington and the Drygalski Ice Tongue, along the coast of Northern Victoria Land. The station was called Baia Terra Nova until 2004. The station is built right on the shore, on a granite rocky peninsula with a north-south orientation. The area assigned to the buildings provides easy access from/to the sea from both east and west. The small inlet on the east shore is particularly suited for unloading cargo at the beginning of the season, when the sea is totally covered with ice. The fast-ice in Tethys Bay is used at the beginning of the season as an aircraft landing place. The main facilities are runways, helipads, plants (power production, incinerator, waste water treatment, desalinator, liquefier), fuel storage and aquarium.

General research and databases

Terra Nova Bay area has been widely scientifically investigated in the last thirty-two years, through extensive geological, oceanographic, marine, ecological and biological research. Marine biological research activities were carried out in the area during the austral summers since the early 1990s including fish community dynamics (in particular the Silver fish). Since 1987, the Meteo-Climatological Observatory of the Programma

FACILITIES INFRASTRUCTURE

Area under roof (m ²)	7500
Area scientific laboratories (m ²)	2400
Type of scientific laboratories: Astrophysics, Biology, Chemistry, Climate, Geodesy, Geology, Geomagnetism, Geophysics, Glaciology, Gravimetric, Ionosphere, Scientific diving, Seismology	
Conference room (capacity)	100
Logistic area (m ²)	5100
Number of beds	124
Showers	Yes
Laundry facilities	Yes
Power supply type	Fossil fuel
Power supply (V)	380
Power supply (hours per day)	24
Hydroponics facilities	Yes
Number of staff on station (peak/summer season)	80
Number of scientists on station (peak/summer season)	40
Number of staff on station (off peak/winter season)	
Number of scientists on station (off peak/winter season)	
Max number of personnel at a time (staff, scientists and others)	120
Specific device/Scientific equipment: The station has several research facilities that include helicopters, boats (a 15 m oceanographic vessel and six rubber-dinghies), terrestrial cross-country vehicles (mainly as support of scientific activities in remote areas) and common laboratories.	
Scientific services possible: Along with helicopter and airplane services for remote field research, a diving research service is available as well, allowed by the regular presence on field of professional divers. For this purpose a hyperbaric chamber is available at MZS.	
Long-term monitoring/observations: Long-term monitoring and observations consist of: five year-round automatic observatories (geomagnetism, ionosphere, seismology, space weather and surface radiative fluxes), the Meteo-climatic PNRA AWS network (since 1987), the permafrost active layer monitoring CALM grid (since 2000), the long-term monitoring of Adélie penguin colonies at Adélie Cove and of silver fish reproduction at Terra Nova Bay.	

Nazionale di Ricerche in Antartide (PNRA) has collected meteorological data by means of several automatic weather stations (over thirty at present) installed in the Victoria Land region. Measurements of the size of Adélie penguin colonies of the southern Ross Sea since 1984 are among the longest biologic time series in Antarctica. At Boulder Clay, since 2000, an automatic station (CALM protocol grid) is monitoring the permafrost thermal regime.

Features in the facility area

Bird colonies, Blue ice, Bluff, Clear air zone, Coast, Crevasse, High elevation, Hill, Ice cap or glacier, Ice shelf, Ice tongue, Lake, Low artificial light pollution, Low humidity, Melt streams, Moraine, Mountain, Nunatak, Other Biological, Permanent snowpatches, Plateau, Rock, Sea, Sea ice, Seal colonies, Shoreline, Snow, Sustrugui, Terrestrial geothermal, Valley.

Main science disciplines

Astrophysics, Atmospheric chemistry and physics, Climate change, Climatology, Ecology, Environmental sciences, Fishery, Geodesy, Geology, Geomorphology, Geophysics, GIS, Glaciology, Hydrology, Isotopic chemistry, Limnology, Mapping, Marine biology, Medicine, Microbiology, Oceanography, Paleocology, Pollution, Soil science, Terrestrial biology.

MEDICAL FACILITIES

Area of medical facility (m ²)	60	Yes
Staff with basic medical training or doctor (Summer)	3	
Staff with basic medical training or doctor (Winter)	0	
Capability: Basic, Dental, Surgery		
Equipment: Anaesthesia, Diagnostic ultrasound, Diagnostic X-ray, Hyperbaric Recompression Chamber, Laboratory diagnostics, Ophthalmology, Telemedicine, Surgical theatre, Traumatology, Portable field X-ray		
Distance to hospital (km)	3500	
Closest emergency facility in Antarctica (km)	360	
Closest emergency facility external (km)	3500	
Medical research capabilities	No	
Medical screening requirements	Yes	

VEHICLES AT FACILITY

Sea transportation: "Malippo" 15 m aluminum boat, "Skua" 14 m boat, four Zodiac rubber boats
Land transportation: Ten pickup trucks, one minibus, six quad bikes, eight skidoos, snow groomer

WORKSHOP FACILITIES

Electrical, ICTS, Mechanical, Metal workshop, Plexiglas workshop, Welding, Wood workshop

COMMUNICATIONS

Computer, E-mail, Fax, Internet, Printer, Satellite phone, Scanner, Telephone, VHF

TRANSPORT AND FREIGHT

Access	Air, Sea
Transport to facility: Airplane, Helicopter, Ship	
Number of airstrips	4
Length (m) of longest runway	3000
Width (m) of longest runway	70
Number of flight visits per year	20
Period of flight visits per year: January, February, October, November, December	
Helipad	Yes
Number of ship visits per year	1
Period of ship visits per year: January	
Ship landing facilities: Pier/Jetty	

Concordia

Institut Polaire Francais Paul Emile Victor /
Programma Nazionale Di Ricerche in Antartide

75°06'06"S 123°19'95"E

Type: Station

Operational period: Year-round

Location

Concordia station is located at Dôme C, on the high East Antarctic plateau. The site is one of the coldest and among the most remote places on Earth. Among the year-round stations in Antarctica, only 3 are located inland the continent (Amundsen-Scott, Vostok and Concordia). The closest stations are Dumont d'Urville and Mario Zucchelli.

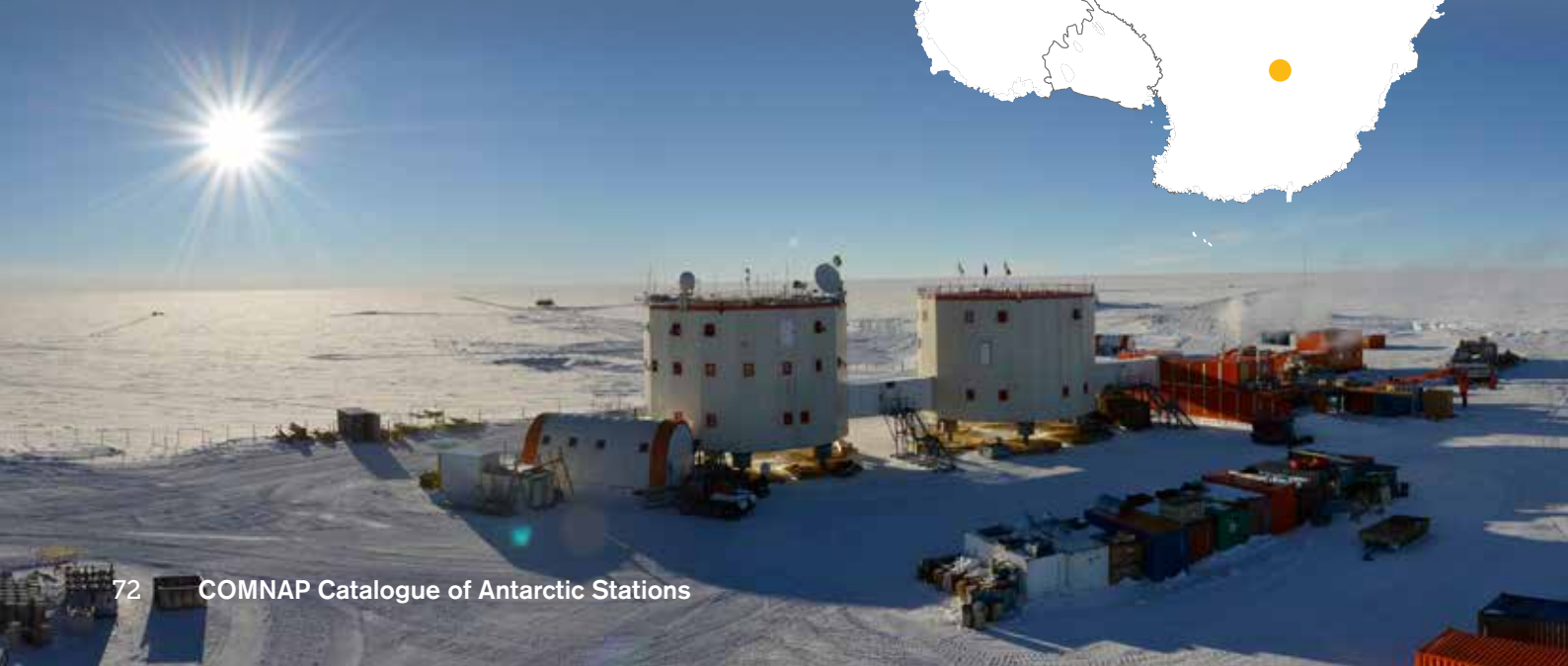
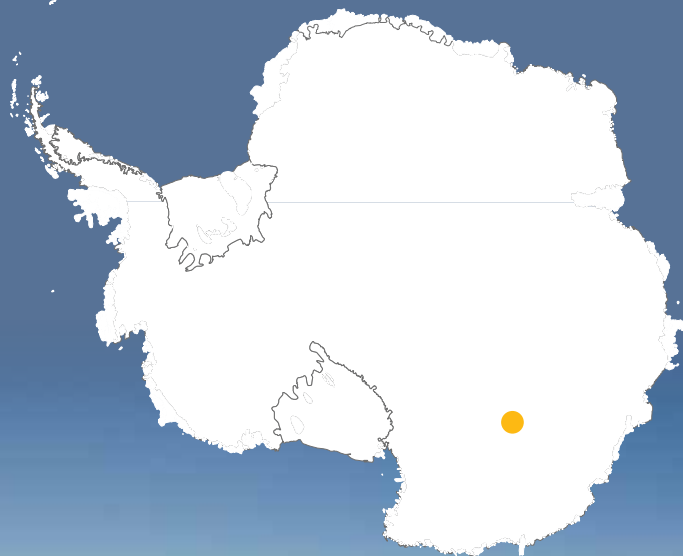
Biodiversity and natural environment

Dome C is 1100 km from the coast at a height of 3233m a.s.l., surrounded by thousands of kilometers of solid ice. Temperatures hardly rise above -25°C in summer and can fall below -80°C in winter with record of -84.6°C reached in 2010. As a consequence, there is no fauna and no flora.

History and facilities

The idea of constructing a European permanent research station in the heart of Antarctica, with an environment particularly hostile for humans, sprang up when the site at Dome C was revealed to be especially favourable for deep ice coring and astronomy. This scientific challenge is accompanied by another, parallel adventure: the design and construction of a modern station, capable of yielding new scientific knowledge concerning not only Antarctica, but also concerning the whole our planet and beyond, the Universe. The Institut Polaire Francais Paul Emile Victor (IPEV) and the Programma Nazionale di Ricerche in Antartide (PNRA) have therefore pooled their skills and know-how, resources and combined operations to develop this new station between 1999 and 2005. Concordia has been continuously occupied since that time.

CLIMATE	
Climate zone	Inland Antarctica
Permafrost	None
Mean annual wind speed (km/h)	10.8
Max wind speed (km/h)	114.8
Dominant wind direction	S
Sea Ice Break Up	None
Snow free period	None
Total annual precipitation (mm)	
Precipitation type	Snow
Mean annual temperature (°C)	-52.1
Mean temperature in February (°C)	-43.7
Mean temperature in July (°C)	-64.2
ENVIRONMENT	
Region	Continental Antarctica
Antarctic Environmental Domain: Q – East Antarctic high interior ice sheet	
Antarctic Conservation Biogeographic Region:	
Altitude of facility (m)	3233
Type of surface facility built on	Ice-sheet
Long term monitoring	Yes
Waste management	Yes
Hazard(ous) management	Yes
Fuel spill response capability	Yes



General research and databases

The research projects implemented at Concordia are linked to many subjects involving societal concerns, such as climate change, the role of greenhouse gases or aerosols in past and present trends or the hole in the ozone layer. Beside the European Project for Ice Coring in Antarctica (EPICA), which was completed in December 2004 and extended the record of climate variability to around 800,000 years BP, Concordia remains an active site for glaciology. Dome C also offers an exceptional environment for astronomical observations and provides good conditions for calibration and validation of sensors embarked on polar orbit satellites. Observatories in seismology, geomagnetism, or Earth-Sun interactions are present. Concordia station itself is also considered as an excellent Earth-based analogue for orbital space stations or Mars-bound vessels and projects in collaboration with the European Space Agency (ESA) are implemented.

Features in the facility area

Clear air zone, Ice cap or glacier, Low artificial light pollution, Low humidity, Plateau, Sustrugui.

Main science disciplines

Astonomy, Astrophysics, Atmospheric chemistry and physics, Engineering, Environmental sciences, Geophysics, Glaciology, Human biology, Medicine, Microbiology, Paleoclimatology, Planetary Science.



FACILITIES INFRASTRUCTURE	
Area under roof (m ²)	3605
Area scientific laboratories (m ²)	748
Type of scientific laboratories: Astronomy, Chemistry, Geophysics	
Conference room (capacity)	
Logistic area (m ²)	2856
Number of beds	80
Showers	Yes
Laundry facilities	Yes
Power supply type	Fossil fuel
Power supply (V)	230
Power supply (hours per day)	24
Hydroponics facilities	No
Number of staff on station (peak/summer season)	35
Number of scientists on station (peak/summer season)	35
Number of staff on station (off peak/winter season)	8
Number of scientists on station (off peak/winter season)	5
Max number of personnel at a time (staff, scientists and others)	80
Specific device/Scientific equipment: No basic scientific equipment. Each project should bring its own necessary scientific equipment. Scientific services possible: A scientific engineer (electrician) is appointed in winter for monitoring and maintenance of automated programs.	
Long-term monitoring/observations: Earth magnetism (INTERMAGNET Network), Seismology (GEOSCOPE Network), Stratospheric ozone, SuperDARN (Super Dual Auroral Radar Network), Glacier mass balance, Baseline Surface Radiation Network (BSRN), meteorology (incl. Radio-sounding).	
MEDICAL FACILITIES	
Area of medical facility (m ²)	120
Staff with basic medical training or doctor (Summer)	2
Staff with basic medical training or doctor (Winter)	2
Capability: Basic, Dental, Surgery	
Equipment: Altitude medicine, Anaesthesia, Biochemistry, Diagnostic ultrasound, Diagnostic X-ray, Haematology, Laboratory diagnostics, Telemedicine, Echography	
Distance to hospital (km)	5000
Closest emergency facility in Antarctica (km)	1100
Closest emergency facility external (km)	5000
Medical research capabilities	Yes
Medical screening requirements	Yes
VEHICLES AT FACILITY	
Sea transportation:	
Land transportation: One 4WD, two snow groomers, five skidoos, one tracked loader, one telehandler, one tractor during summer, bicycles	
WORKSHOP FACILITIES	
ICTS, Mechanical, Metal workshop, Wood workshop	
COMMUNICATIONS	
Computer, E-mail, Internet, Satellite phone, Telephone, VHF	
TRANSPORT AND FREIGHT	
Access	Air, Land
Transport to facility: Airplane, Traverses from Cap Prud'homme	
Number of airstrips	1
Length (m) of longest runway	2000
Width (m) of longest runway	50
Number of flight visits per year	20
Period of flight visits per year: January, February, November, December	
Helipad	No
Number of ship visits per year	
Period of ship visits per year:	
Ship landing facilities:	