IAMCO-YOPP

Italian Antarctic Meteo-Climatological Observatory at MZS, Victoria Land and at Concordia

http://www.climantartide.it

Principal investigator

Paolo Grigioni

paolo.grigioni@enea.it

ENEA

Areas of contribution

Polar atmospheric processes

Modelling and forecasting

Observations

Data archiving

Summary

Systematic meteorological ground observations and radio soundings are performed at Mario Zucchelli Station (MZS) and Victoria Land (VL) since 1987; and at Concordia Station (DC) since 2005. This project aims to continue collecting data for time series, (up to 28 years of data for MZS/VL, up to 10 years for Concordia), for meteo-climatological monitoring of the area, to strengthen scientific data of other projects and for operational activities taking place at the base.

Description

Meteorological measures in Antarctica are sparse compared to the wide extent of the territory especially regarding to the interior of the continent. Meteorological observatory in the VL is of great importance because the relative proximity of the plateau to the coast generates exceptional phenomena such as katabatic winds and
the presence of one of the most extensive polynyia around Antarctica; moreover, as pointed out by SCAR, the presence of abundant rainfall and the subsequent transport of snow towards the sea are crucial parameters for mass balance study. The availability of continuous observations in a wide area of the Antarctic territory, also provides an essential contribution to the improvement of the atmospheric numerical models with an immediate effect on the operational flight activity and weather forecasting for the entire Antarctic community.

[This project contains two project parts: the observatory at MZS and Victoria Land; and the observatory at Concordia. Methods and topics of the projects are almost alike, the differences are shown in brackets.]

At present systematic meteorological ground observations are performed at Mario Zucchelli Station (MZS) and Victoria Land (VL) by means of 15 automatic weather stations (AWS) running continuously throughout the year; a radiosonde system, a ceilometer for the measurement of cloud base, a sky camera and a rain gauge operating only during summer season integrate the Observatory instrumentations. Data of several AWS's are transmitted in real time via radio modem or Iridium towards MZS during the summer, and throughout the year via the Argos satellite system. All produced meteorological data are used by the scientific community, for the local forecast and for planning of flight activity. Real time transmission of synoptic meteorological messages on the international network (WMO-GTS) allows the assimilation in meteorological models, and contributes to the improvement of their performance.

[On the DC an automatic weather station (AWS) and a radiosonde system (one sounding a day, throughout the year) are conducted.]

This observative activity assumes greater value in the framework of the WMO Polar Prediction Project (PPP). Therefore, especially during the intensive measurements PPP campaign, the Observatory needs to update instrumentation, improve data quality and increase measured parameters as specified and suggested in the PPP Science Plan and in the Implementation Plan for the YOPP.

In the recent past, the Joint Working Group on Forecast Verification Research has emphasized the importance of measures of precipitation and clouds base and coverage. In this perspective the Observatory request funds in order to acquire a new ceilometer for measuring base and thickness of the clouds, replacing the existing one discontinued since many years, a radar rain gauge and two new AWS's. [For Concordia: the Observatory request funds in order to acquire a ceilometer for measuring base and thickness of the clouds, a camera for the observations of the sky, and a radar rain gauge.] In this framework it will be necessary the renewal of obsolete instruments and intensify the number of soundings per day.

The standard or extraordinary maintenance of the instrumentation, the collection, validation, storage and dissemination of data will be the main activity during the next four years.

Data sampled by AWS's and sent in real time to MZS Weather-Office will be included, together with radiosoundings, in the Basic Synoptic Network of the World Meteorological Organization.

Particular attention will be paid to the validation of the data and their distribution through a website already active for years (http://www.climantarntide.it).

The acquired data also contribute to the WMO Basic Synoptic Network and to the database of the SCAR (MetREADER).

Update addressing YOPP Special Observing Periods (SOPs) in May 2017: "we plan to double radiosoundings during IOP periods in the framework of SOP-SH at both stations: at MZS from two every day to four (in cooperation with Korean JangBogo Station) and from one to two every day at Concordia Station. Moreover we wish to install new ceilometers at both Stations."
Timeline

2016-01-01 - 2019-12-25

Regional emphasis

Northern hemisphere: No
Southern hemisphere: Yes

Key project deliverables

- Distribution of synoptic data in real time on the international meteorological network throughout the year
- Validation and storage on database each year within two months from the end of the campaign.
- Hardware and software updating of the meteorological instrumentation
- Maintenance of instrumentation.
- database and website (www.climantartide.it) updating: continuous activity for the duration of the Project.

Data management

www.climantartide.it at ENEA research centre "Casaccia" (Rome, Italy)

Is data provided to WMO Global Telecommunication System

No

Real-time provision

Synop and Temp messages

Other information

AWS name geographical name latitude - longitude
SOFIA-B David Glacier 75° 35' S 158° 19' E
ALESSANDRA Cape King 73° 35' S 166° 37' E
ZORAIDA Priestley Glacier 74° 15' S 163° 10' E
ENEIDE Terra Nova Bay 74° 42' S 164° 06' E
RITA Enigma Lake 74° 43' S 164° 02' E
MODESTA Priestley Nèvè 73° 38' S 160° 39' E
LOLA Sarao Point - Tourmaline Plateau 74° 08'S 163° 26' E
ARELIS Cape Ross 76° 43' S 162° 58' E
SILVIA Cape Philips 73° 03' S 169° 36' E
GIULIA Mid Point 75° 33’ S 145 ° 50' E
MARIA Point Charlie 74° 37' S 164° 00' E
PENGUIN Edmonson Point 74° 20' S 165° 08' E
PAOLA Talos Dome 72° 46' S 159° 02’ E
LUCIA Larsen Glacier 74° 57' S 161° 46' E

This Project has been approved by CSNA (Italian National Antarctic Scientific Committee) and will be funded during 2016

**Timelines**

<table>
<thead>
<tr>
<th>Location</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Start date</th>
<th>End date</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>MZS</td>
<td>.</td>
<td>.</td>
<td>2016-01-01</td>
<td>2019-12-31</td>
<td>Two daily radiosoundings, Four daily radiosoundings during YOPP special campaign</td>
</tr>
<tr>
<td>Concordia Station</td>
<td>.</td>
<td>.</td>
<td>2016-01-01</td>
<td>2019-12-31</td>
<td>One daily radiosoundings, Two daily radiosoundings during YOPP special campaign</td>
</tr>
<tr>
<td>Concordia Station</td>
<td>.</td>
<td>.</td>
<td>2016-01-01</td>
<td>2019-12-31</td>
<td>AWS maintenance</td>
</tr>
<tr>
<td>AWS SOFIA-B - David Glacier</td>
<td>75° 35' S</td>
<td>158° 19' E</td>
<td>2016-01-01</td>
<td>2019-12-31</td>
<td>Maintenance Campaign every Austral Summer</td>
</tr>
<tr>
<td>AWS ALESSANDRA - Cape King</td>
<td>73° 35' S</td>
<td>166° 37' E</td>
<td>2016-01-01</td>
<td>2019-12-31</td>
<td>Maintenance Campaign every Austral Summer</td>
</tr>
<tr>
<td>AWS ZORAIDA - Priestley Glacier</td>
<td>74° 15' S</td>
<td>163° 10' E</td>
<td>2016-01-01</td>
<td>2019-12-31</td>
<td>Maintenance Campaign every Austral Summer</td>
</tr>
<tr>
<td>AWS ENEIDE - Terra Nova Bay</td>
<td>74° 42' S</td>
<td>164° 06' E</td>
<td>2016-01-01</td>
<td>2019-12-31</td>
<td>Maintenance Campaign every Austral Summer</td>
</tr>
<tr>
<td>AWS RITA - Enigma Lake</td>
<td>74° 43' S</td>
<td>164° 02' E</td>
<td>2016-01-01</td>
<td>2019-12-31</td>
<td>Maintenance Campaign every Austral Summer</td>
</tr>
<tr>
<td>AWS MODESTA - Priestley Nèvè</td>
<td>73° 38' S</td>
<td>160° 39' E</td>
<td>2016-01-01</td>
<td>2019-12-31</td>
<td>Maintenance Campaign every Austral Summer</td>
</tr>
<tr>
<td>AWS LOLA - Sarao Point - Tourmaline Plateau</td>
<td>74° 08' S</td>
<td>163° 26' E</td>
<td>2016-01-01</td>
<td>2019-12-31</td>
<td>Maintenance Campaign every Austral Summer</td>
</tr>
<tr>
<td>AWS ARELIS - Cape Ross</td>
<td>76° 43' S</td>
<td>162° 58' E</td>
<td>2016-01-01</td>
<td>2019-12-31</td>
<td>Maintenance Campaign every Austral Summer</td>
</tr>
<tr>
<td>AWS SILVIA - Cape Philips</td>
<td>73° 03' S</td>
<td>169° 36' E</td>
<td>2016-01-01</td>
<td>2019-12-31</td>
<td>Maintenance Campaign every Austral Summer</td>
</tr>
<tr>
<td>Location</td>
<td>Latitude</td>
<td>Longitude</td>
<td>Start date</td>
<td>End date</td>
<td>Activity</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>------------</td>
<td>-------------</td>
<td>----------------</td>
<td>--------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>AWS GIULIA - Mid Point</td>
<td>75° 33’ S</td>
<td>145 ° 50’ E</td>
<td>2016-01-01</td>
<td>2019-12-31</td>
<td>Maintenance Campaign every Austral Summer</td>
</tr>
<tr>
<td>AWS MARIA - Point Charlie</td>
<td>74° 37’ S</td>
<td>164° 00’ E</td>
<td>2016-01-01</td>
<td>2019-12-31</td>
<td>Maintenance Campaign every Austral Summer</td>
</tr>
<tr>
<td>AWS PENGUIN - Edmonson Point</td>
<td>74° 20’ S</td>
<td>165° 08’ E</td>
<td>2016-01-01</td>
<td>2019-12-31</td>
<td>Maintenance Campaign every Austral Summer</td>
</tr>
<tr>
<td>AWS PAOLA - Talos Dome</td>
<td>72° 46’ S</td>
<td>159° 02’ E</td>
<td>2016-01-01</td>
<td>2019-12-31</td>
<td>Maintenance Campaign every Austral Summer</td>
</tr>
<tr>
<td>AWS LUCIA - Larsen Glacier</td>
<td>74° 57’ S</td>
<td>161° 46’ E</td>
<td>2016-01-01</td>
<td>2019-12-31</td>
<td>Maintenance Campaign every Austral Summer</td>
</tr>
</tbody>
</table>