ITALIAN CLIMATOLOGY IN ANTARCTICA. THE TEMPERATURES IN THE PERIOD 1987-1994: PRELIMINARY ANALYSIS

CLIMATOLOGIA ITALIANA IN ANTARTIDE. LE TEMPERATURE NEL PERIODO 1987-1994: ANALISI PRELIMINARE

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1. INTRODUCTION

Since 1987, some “AWS” (Automatic Weather Stations), measuring instant, highest and lowest temperature, atmospheric pressure, wind speed, relative humidity, sun radiation), have been installed around the Italian base in Antarctica, in Terra Nova Bay, Ross Sea. This is a zone of great interest for climate, as the conflict between katabatic flow and moist air coming from the sea causes several precipitations. The Department of Earth Science of Turin University is in charge of the elaboration of the parameters of temperature, sun radiation and relative humidity.

This work presents a preliminary analysis of the daily average temperature, highest and lowest.

2. GEOGRAPHIC LOCALISATION AND FEATURES OF THE SURVEY STATIONS

The survey stations are located within a range of about 200 km around the Italian base in the Antarctic continent in Terra Nova Bay. Fig. 1 shows their position and Tab. 1 shows their geographic features. The stations are always listed in order of increasing altitude.

3. DATA CONSISTENCE

AWS take one measure every three hours. In this way, we have 8 data per day, but instrumental breakdowns have made the series incomplete and we have sequences of days without data, in particular from April to September.

After having evaluated the distribution of the data, we decided to consider only the days with at least 50% data (4 data). Rejecting the days with less than 4 observations involves a further loss of information reducing the number of values on which we might calculate monthly and annual averages.

Tab. 2 line 1 represents the number of derivations for each station, in comparison with the theoretical availability and relative percentage (line 2, 3). Tab. 3 synthesises the monthly situation.

Nevertheless we can see that the above-mentioned instrumental breakdowns are concentrated especially in the central months of the year, and they may lead to an overvaluation of the annual average. In order to examine whether a comparison between the stations is possible in the periods of common operation, we adopted the