



*Supplement of*

## **Climatology of snow depth and water equivalent measurements in the Italian Alps (1967–2020)**

**Roberto Ranzi et al.**

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## 5 **Supplement**

### 10 **Description**

In this document we report:

- 1) a summary of all the measurements analysed for each macro-basin, elevation class and measurement date. The total number of snow depth measurements is 44'411 and the total number of bulk snow density measurements is 14'479;
- 2) the values of winter (DJFM) North Atlantic Oscillation (NAO) and Western Mediterranean Oscillation (WeMO);
- 15 3) the timeseries of snow depth of the MARTA triangles presented in the manuscript;
- 4) MARTA triangles of the HS and SWE timeseries.

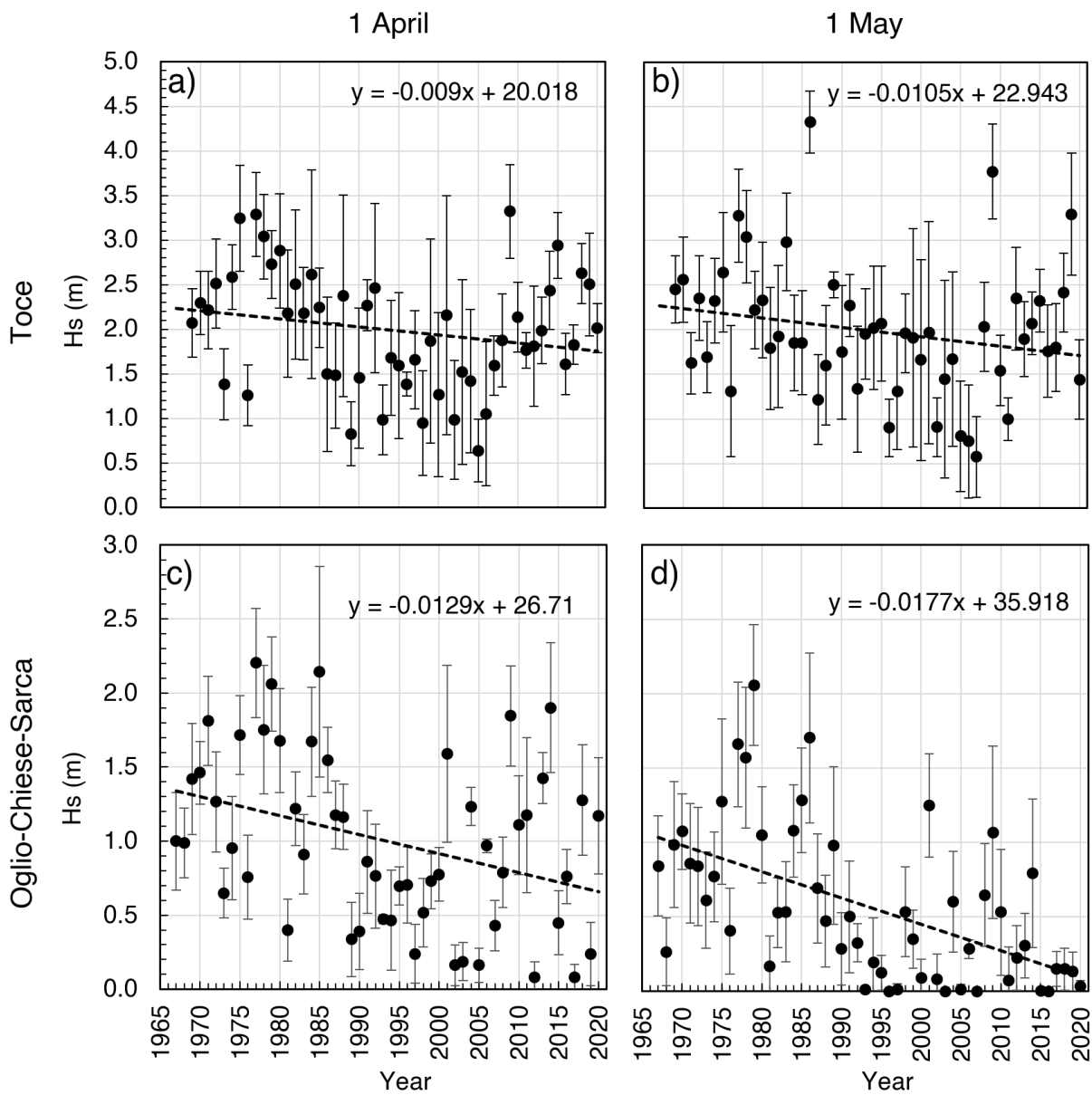
**Table S1.** Number of HS and bulk snow density measurements for macro basin in the different elevation classes.

| <b>Basin</b>       | <b>Elevation class</b> | <b>N° HS measurements</b> | <b>N° <math>\rho_s</math> measurements</b> |
|--------------------|------------------------|---------------------------|--|
| Piave-Brenta       | 1000-1500              | 4307                      | 1796                                       |
|                    | 1500-2000              | 3525                      | 1565                                       |
|                    | 2000-2500              | 1302                      | 842  |
|                    | 2500-3000              | 183                       | 90   |
| Adige              | 1000-1500              | 256                       | 97   |
|                    | 1500-2000              | 1869                      | 471  |
|                    | 2000-2500              | 1112                      | 412  |
|                    | 2500-3000              | 1297                      | 901  |
| Oglio-Chiese-Sarca | 1000-1500              | 3036                      | 851  |
|                    | 1500-2000              | 4144                      | 860  |
|                    | 2000-2500              | 5007                      | 1710                                       |
|                    | 2500-3000              | 2041                      | 1109                                       |
| Serio-Brembo       | 1000-1500              | 200                       | 0  |
|                    | 1500-2000              | 4287                      | 728  |
|                    | 2000-2500              | 1361                      | 677  |
|                    | 2500-3000              | 8                         | 7  |
| Adda               | 1000-1500              | 0                         | 0  |
|                    | 1500-2000              | 1633                      | 591  |
|                    | 2000-2500              | 1953                      | 828  |
|                    | 2500-3000              | 54                        | 0  |
| Toce               | 1000-1500              | 442                       | 0  |
|                    | 1500-2000              | 2250                      | 236  |
|                    | 2000-2500              | 4025                      | 708  |
|                    | 2500-3000              | 119                       | 0  |

**Table S2.** Winter (DJFM) North Atlantic Oscillation (NAO) and Western Mediterranean Oscillation (WeMO) indexes used in the paper.

| <b>Year</b> | <b>NAO</b> | <b>WeMO</b> | <b>Year</b> | <b>NAO</b> | <b>WeMO</b> | <b>Year</b> | <b>NAO</b> | <b>WeMO</b> |
|-------------|------------|-------------|-------------|------------|-------------|-------------|------------|-------------|
| 1967        | 1.61       | 0.64        | 1985        | -0.38      | 0.12        | 2003        | 0.40       | -0.29       |
| 1968        | -0.02      | 0.33        | 1986        | -0.03      | 0.64        | 2004        | -0.20      | -0.16       |
| 1969        | -2.09      | -0.26       | 1987        | 0.34       | 0.31        | 2005        | -0.11      | -0.29       |
| 1970        | -0.53      | 0.99        | 1988        | 0.10       | 0.78        | 2006        | -0.82      | -0.20       |
| 1971        | -0.64      | -0.25       | 1989        | 2.86       | -0.09       | 2007        | 1.81       | 0.40        |
| 1972        | 0.07       | -0.63       | 1990        | 2.37       | -0.29       | 2008        | 1.34       | -0.28       |
| 1973        | 1.43       | -0.09       | 1991        | 0.21       | -0.82       | 2009        | -0.31      | -0.18       |
| 1974        | 0.49       | -0.03       | 1992        | 1.68       | -0.22       | 2010        | -2.71      | -0.43       |
| 1975        | 1.16       | 0.13        | 1993        | 1.43       | -0.75       | 2011        | -0.84      | -0.66       |
| 1976        | 0.59       | -0.42       | 1994        | 1.80       | 0.91        | 2012        | 2.08       | 0.51        |
| 1977        | -1.10      | 0.53        | 1995        | 2.44       | 0.86        | 2013        | -0.58      | 0.72        |
| 1978        | 0.33       | 0.74        | 1996        | -2.32      | -1.00       | 2014        | 2.05       | 0.25        |
| 1979        | -1.34      | 0.67        | 1997        | 0.17       | -0.79       | 2015        | 2.04       | 0.46        |
| 1980        | 0.07       | 0.40        | 1998        | 0.80       | -0.42       | 2016        | 1.83       | 0.46        |
| 1981        | 0.90       | 0.69        | 1999        | 0.98       | -0.20       | 2017        | 1.18       | -0.70       |
| 1982        | 0.25       | 0.32        | 2000        | 1.85       | 0.47        | 2018        | 0.40       | 0.65        |
| 1983        | 2.00       | 0.88        | 2001        | -0.50      | 0.28        | 2019        | 1.47       | 0.57        |
| 1984        | 0.74       | 0.56        | 2002        | 0.79       | -0.42       | 2020        | 2.23       | 0.14        |





25 **Figure S1.** Time series average of snow depth (black dots) in Toce (a, b) and Oglio-Chiese-Sarca (c, d) macro-basins on 1 April (a, c) and 1 May (b, d). Error bars indicate the standard deviation over the specific macro-basin and dashed lines the least-square interpolation line.

