



Cliente ENEL PRODUZIONE

Indirizzo del cliente

Ordine

Campioni/Oggetti in prova Meteorologia della **Postazione di Belvedere – Centrale ENEL di Genova.**

Prove eseguite **Misura dei parametri meteorologici con stazione rilocabile per un periodo di tempo variabile.**

Documenti normativi

Data prove dal **08/03/2006** al **08/08/2006**

I risultati di prova nel presente documento si riferiscono ai soli campioni/oggetti sottoposti a prova.

La parziale riproduzione di questo documento è permessa solo con l'autorizzazione scritta del CESI.

N. pagine 70 **N. pagine fuori testo** -

Data di emissione 11/09/2006

Elaborato BU AMB – Walter Sonlieti

Verificato BU AMB – Gabriele Carboni

Approvato Antonio Fiore – Responsabile Linea Atmosfera

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1 INFORMAZIONI SPECIFICHE

Data ricevimento dei campioni/oggetti in prova

Luogo di esecuzione delle prove

Postazione di Belvedere – Centrale ENEL di Genova, nel sito di Genova.

Le coordinate UTM della postazioni sono:

4918464 (N); 491614 (E), quota 127 m s.l.m.

P703 – Laboratori Monitoraggio qualità dell'aria

Laboratorio di prova

Personale di prova CESI

Sonlieti Walter, Cottarelli Giacomo, Carmignato

Fabrizio, Delfanti Angelo, Bassi Roberto, Nani Angelo

Presenti alle prove

-

Documenti di riferimento

Misura dei parametri meteorologici con stazione rilocabile per un periodo di tempo variabile.

Informazioni sul campionamento

Data di campionamento

Eseguito da

I campioni/oggetti provati devono essere conservati? NO

Esiste documentazione di dettaglio non allegata al presente documento ? SI

I FRD e la documentazione di elaborazione intermedia sono conservati nel Raccoglitore di Genova prot. A6011523.

I file dei dati e del rapporto sono archiviati nella SubDir: Y:\ATMOSFERA\AAM\LQE2RP\381GEN3BEM.

I dati meteo misurati in continuo sono archiviati nel formato standard previsto dalle procedure di prova nei file aventi nomi: GENOV3BE.MTS e GENOV3BE.STB.

2 PROVE ESEGUITE

Il presente Rapporto di Prova contiene i risultati delle prove di seguito elencate.

Misure in continuo dei parametri meteorologici:

- “Misura dei parametri meteorologici per un periodo di tempo variabile” eseguita nella postazione di Belvedere - Centrale ENEL di Genova dalle ore 14:00 (ora solare) del 03 marzo 2006 alle ore 10:00 (ora solare) del 08 agosto 2006.

3 APPARECCHIATURE UTILIZZATE E PUNTI DI MISURA

La strumentazione utilizzata è riportata nel seguente prospetto:

| NOME POSTAZIONE | 3 BELVEDERE |
|--|-------------------------|
| Coordinate geografiche (ED50 UTM32 LLMM) | 4918464 (N); 491614 (E) |

| | |
|--|---|
|  |  |
|--|---|

| STRUMENTI PER LE MISURE IN CONTINUO | |
|--|---|
| Temperatura dell'aria/Umidità relativa | Temperatura: termocoppia Pt100 1/3 Din (-30°÷+70 °C; toll. 0.2°C) racchiusa in un condotto di alluminio con schermo antiradiante e ventilazione naturale dell'aria. Umidità relativa: elemento capacitivo (0÷100%; toll. 3%) conglobato con la termocoppia di temperatura in un unico sensore. Matricola CESI 026713. Periodo dal 8-03-06 al 8-08-06 |
| Pressione atmosferica | Barometro piezometrico (800÷1100 hPa; deriva termica 0.1 hPa/°C). Matricola CESI LQ-3054. Periodo dal 8-03-06 al 8-08-06 |
| Velocità del vento | Sensore a coppe e sistema tachimetrico con disco rotante e lettura optoelettronica (0÷50 m/s; soglia 0.25 m/s; costante ritardo 4.5 m; toll. 1%). Matricola CESI 026040. Periodo dal 8-03-06 al 8-08-06 |
| Direzione del vento | Sensore direzionale a banderuola e un sistema goniometrico a resistenza (0÷360°; toll.1%; soglia 0.3 m/s; percorso di ritardo 1.1 m). Matricola CESI 026046. Periodo dal 8-03-06 al 8-08-06 |
| Radiazione globale | Sensore a termopila che misura la differenza di temperatura di settori alternati bianchi e neri (sens. Spettrale 0.3÷3 µm; lin. 1%). Matricola CESI 6725. Periodo dal 15-07-05 al 9-02-06 |
| Radiazione netta | Sensore a termopila ad elevata sensibilità che misura la differenza tra la radiazione proveniente dal cielo e quella proveniente dalla superficie terrestre (onda corta e lunga) (sens. Spettrale 0.3÷60 µm, linearità 1,5%). Matricola CESI 026031. Periodo dal 8-03-06 al 8-08-06 |
| Precipitazione | Sensore impulsivo costituito da un cono in lega d'alluminio con un'area d'imboccatura di 500 cm ² per la raccolta dell'acqua e da un elemento basculante (accoppiamento di due vaschette simmetriche oscillanti attorno ad un asse orizzontale in equilibrio instabile) posto di sotto all'imbuto, che oscilla ogni qualvolta una vaschetta viene riempita con una quantità pari a 0.2 mm d'acqua (toll. ± 1%). Matricola CESI 026038. Periodo dal 8-03-06 al 8-08-06 |
| Gestione e acquisizione dati misurati in continuo | Acquisitore Lastem modello Babuc s/n 6333 matricola CESI 026657. Periodo dal 8-03-06 al 8-08-06. |

4 RISULTATI DELLE MISURE

Di seguito, i risultati della prova sono riportati sia sotto forma di tabelle, contenenti i dati orari per l'intero periodo, sia sotto forma di grafici, con inizio il lunedì di ogni settimana.

GENOVA -- 3 BELVEDERE ENEL periodo dal 08/03/06 al 08/08/06

Table with columns: Data (gg, mm, aa), Ora, TA (°C), UR (%), VV (m/s), VF (km), DV (°N), SigDV (°), PA (hPa), PP (mm), RN (W/m2), RG (W/m2), VVP (m/s), DP (°N), SigDP (°), ST-115 (-). It contains 100 rows of meteorological data.

GENOVA -- 3 BELVEDERE ENEL periodo dal 08/03/06 al 08/08/06

Table with 16 columns: Data (gg, mm, aa), Ora, TA (°C), UR (%), VV (m/s), VF (km), DV (°N), SigDV (°), PA (hPa), PP (mm), RN (W/m2), RG (W/m2), VVP (m/s), DP (°N), SigDP (°), ST-115 (-). Rows represent hourly data from 16/03/06 to 19/03/06.

GENOVA -- 3 BELVEDERE ENEL periodo dal 08/03/06 al 08/08/06

Table with 17 columns: Data (gg, mm, aa), Ora, TA (°C), UR (%), VV (m/s), VF (km), DV (°N), SigDV (°), PA (hPa), PP (mm), RN (W/m2), RG (W/m2), VVP (m/s), DP (°N), SigDP (°), ST-115 (-). The table contains multiple rows of meteorological data points.

GENOVA -- 3 BELVEDERE ENEL periodo dal 08/03/06 al 08/08/06

Table with 16 columns: Data (gg, mm, aa), Ora, TA (°C), UR (%), VV (m/s), VP (km), DV (°N), SigDV (°), PA (hPa), PP (mm), RN (W/m2), RG (W/m2), VVP (m/s), DP (°N), SigDP (°), ST-115 (-). The table contains 77 rows of meteorological data.

GENOVA -- 3 BELVEDERE ENEP periodo dal 08/03/06 al 08/08/06

Table with 16 columns: Data (gg mm aa), Ora, TA (°C), UR (%), VV (m/s), VF (km), DV (°N), SigDV (°), PA (hPa), PP (mm), RN (W/m2), RG (W/m2), VVP (m/s), DP (°N), SigDP (°), ST-115 (-). Rows contain hourly weather data from 09/04/06 to 12/04/06.

GENOVA -- 3 BELVEDERE ENEL periodo dal 08/03/06 al 08/08/06

Table with 16 columns: Data (gg, mm, aa), Ora, TA (°C), UR (%), VV (m/s), VF (km), DV (°N), SigDV (°), PA (hPa), PP (mm), RN (W/m2), RG (W/m2), VVP (m/s), DP (°N), SigDP (°), ST-115 (-). Rows contain hourly weather data from 13/04/06 to 16/04/06.

GENOVA -- 3 BELVEDERE ENEL periodo dal 08/03/06 al 08/08/06

Table with columns: Data (gg, mm, aa), Ora, TA (°C), UR (%), VV (m/s), VF (km), DV (°N), SigDV (°), PA (hPa), PP (mm), RN (W/m2), RG (W/m2), VVP (m/s), DP (°N), SigDP (°), ST-115 (-). Rows contain hourly meteorological data from 17/04/06 to 20/04/06.

GENOVA -- 3 BELVEDERE ENEL periodo dal 08/03/06 al 08/08/06

Table with columns: Data (gg mm aa), Ora, TA (°C), UR (%), VV (m/s), VF (Kcm), DV (°N), SigDV (°), PA (hPa), PP (mm), RN (W/m2), RG (W/m2), VVP (m/s), DP (°N), SigDP (°), ST-115 (-). The table contains 50 rows of meteorological data for Genova from 2006.

GENOVA -- 3 BELVEDERE ENEL periodo dal 08/03/06 al 08/08/06

Table with columns: Data (gg, mm, aa), Ora, TA (°C), UR (%), VV (m/s), VF (km), DV (°N), SigDV (°), PA (hPa), PP (mm), RN (W/m2), RG (W/m2), VVP (m/s), DP (°N), SigDP (°), ST-115 (-). Contains 100 rows of meteorological data.

GENOVA -- 3 BELVEDERE ENEC periodo dal 08/03/06 al 08/08/06

Table with columns: Data (gg mm aa), Ora, TA (°C), UR (%), VV (m/s), VP (km), DV (°N), SigDV (°), PA (hPa), PP (mm), RN (W/m2), RG (W/m2), VVP (m/s), DP (°N), SigDP (°), ST-115 (-). Contains 76 rows of meteorological data.

GENOVA -- 3 BELVEDERE ENEL periodo dal 08/03/06 al 08/08/06

Table with 16 columns: Data (gg, mm, aa), Ora, TA (°C), UR (%), VV (m/s), VF (km), DV (°N), SigDV (°), PA (hPa), PP (mm), RN (W/m2), RG (W/m2), VVP (m/s), DP (°N), SigDP (°), ST-115 (-). Rows contain hourly meteorological data from 28/06/06 to 01/07/06.

GENOVA -- 3 BELVEDERE ENEL periodo dal 08/03/06 al 08/08/06

Table with 17 columns: Data (gg, mm, aa), Ora, TA (°C), UR (%), VV (m/s), VF (km), DV (°N), SigDV (°), PA (hPa), PP (mm), RN (W/m2), RG (W/m2), VVP (m/s), DP (°N), SigDP (°), ST-115 (-). Rows contain hourly meteorological data from 06/07/06 to 09/07/06.

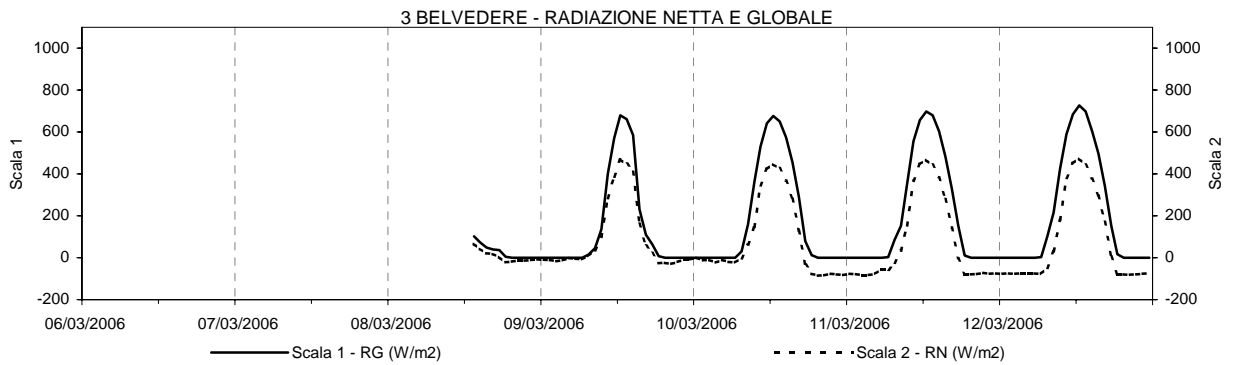
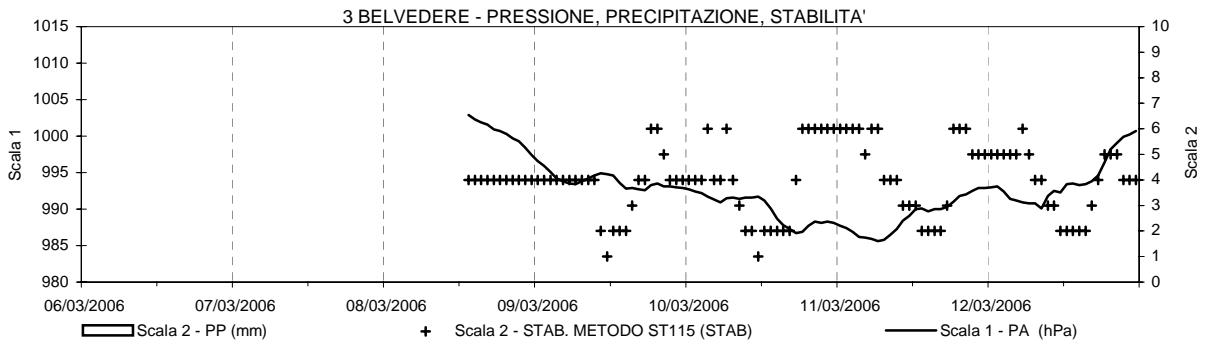
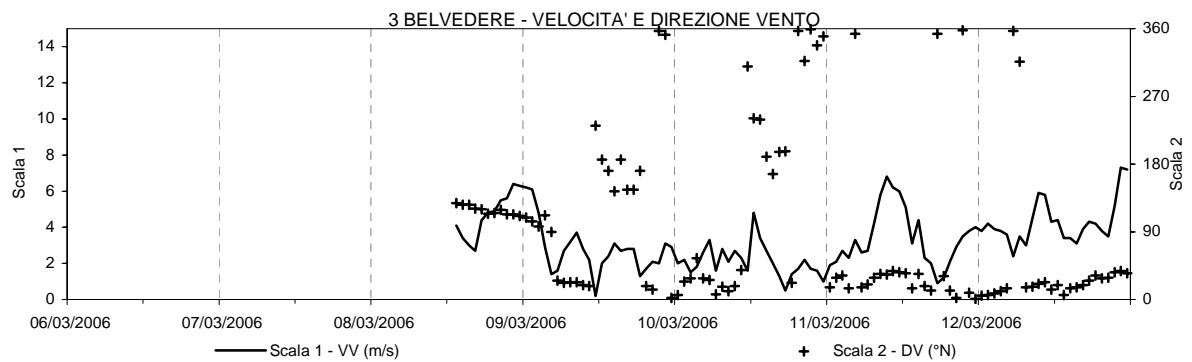
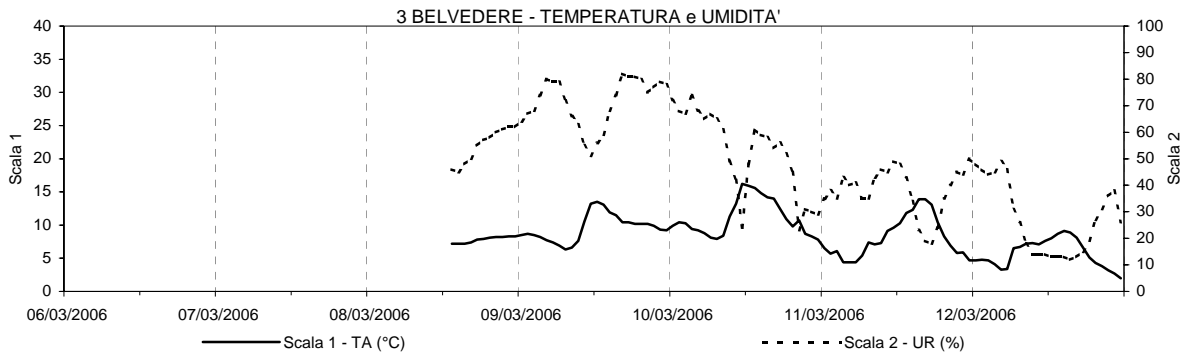
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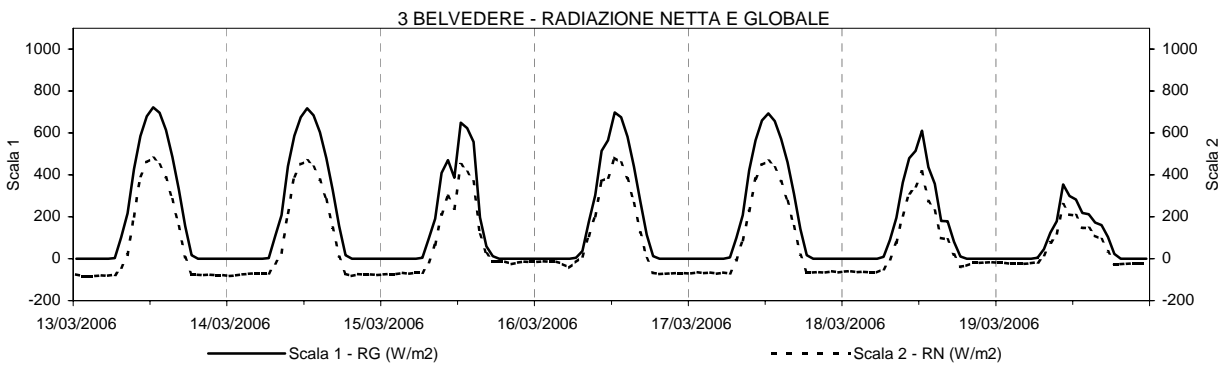
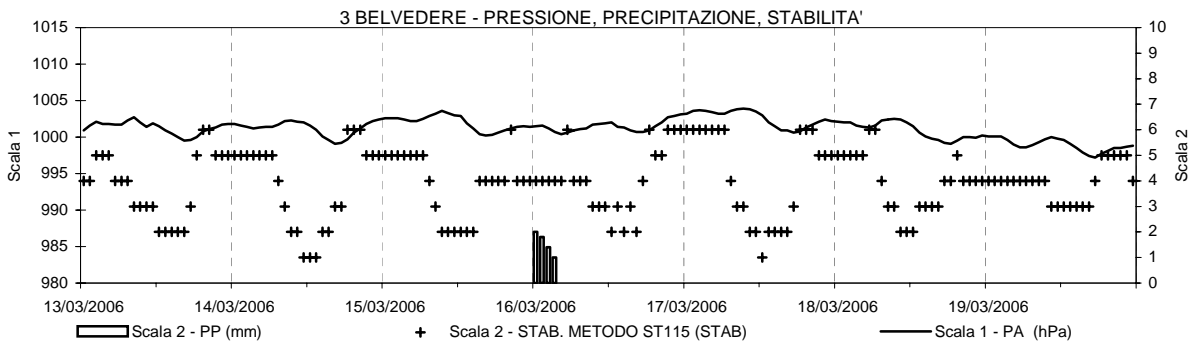
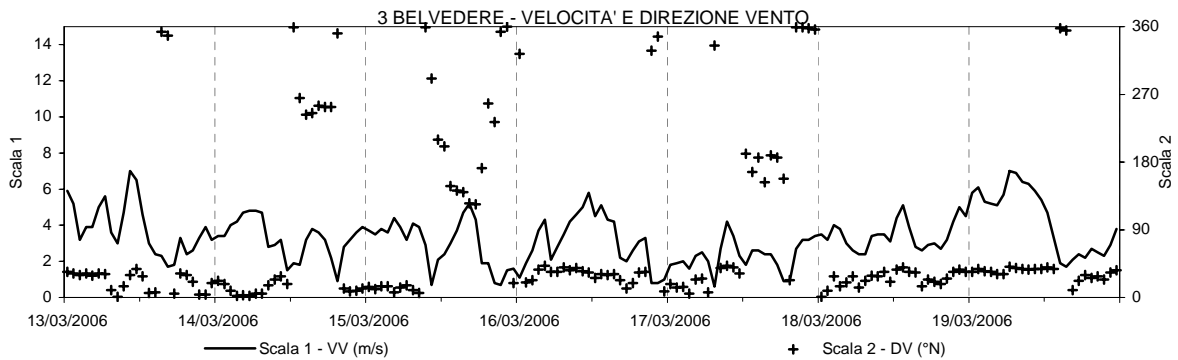
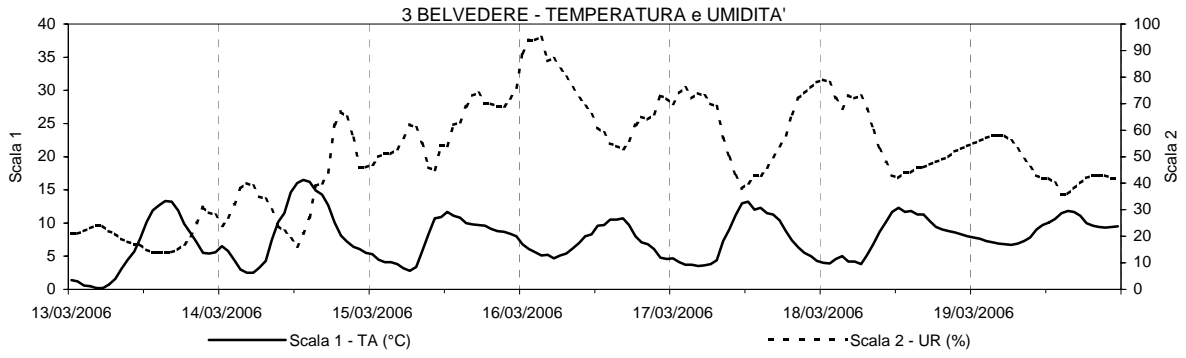
Table with columns: Data (gg, mm, aa), Ora, TA (°C), UR (%), VV (m/s), VF (km), DV (°N), SigDV (°), PA (hPa), PP (mm), RN (W/m2), RG (W/m2), VVP (m/s), DP (°N), SigDP (°), ST-115 (-). The table contains 100 rows of meteorological data.

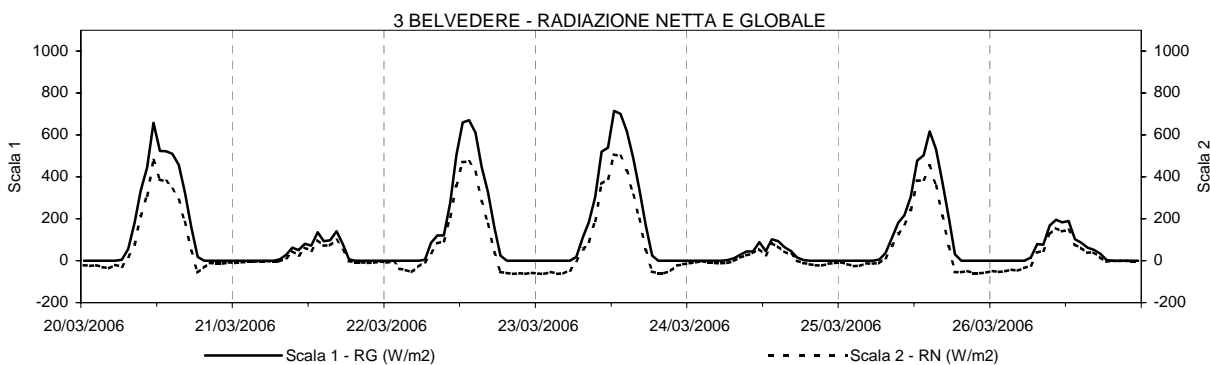
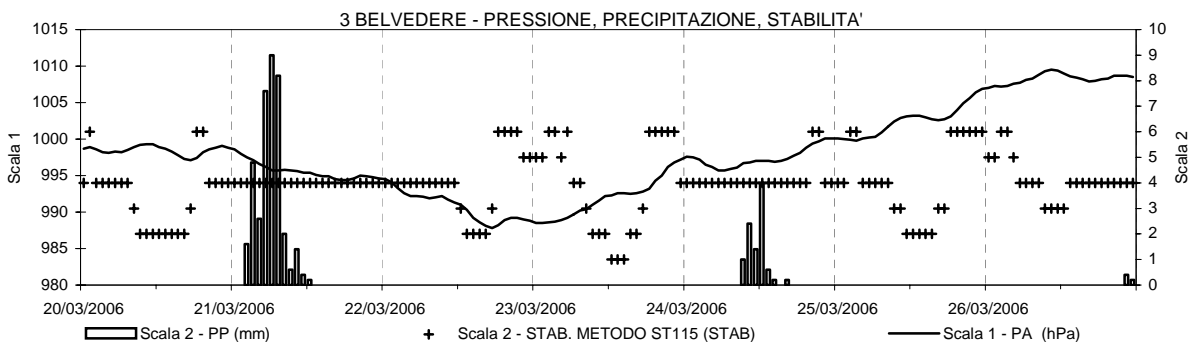
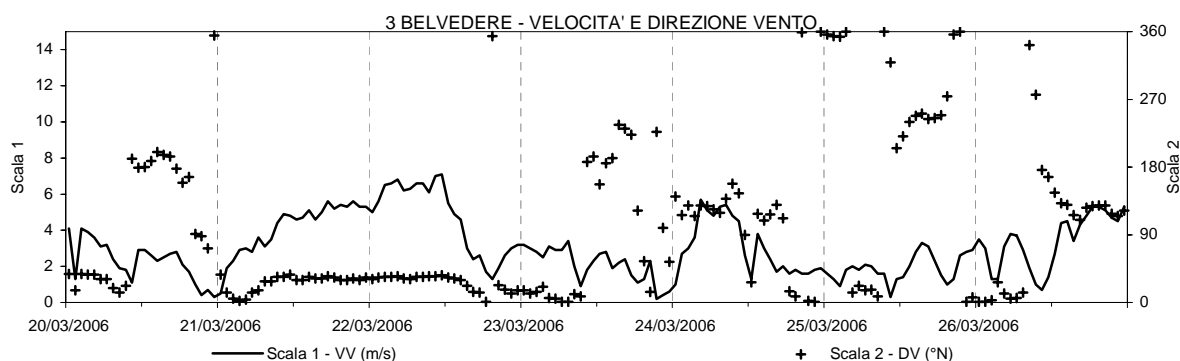
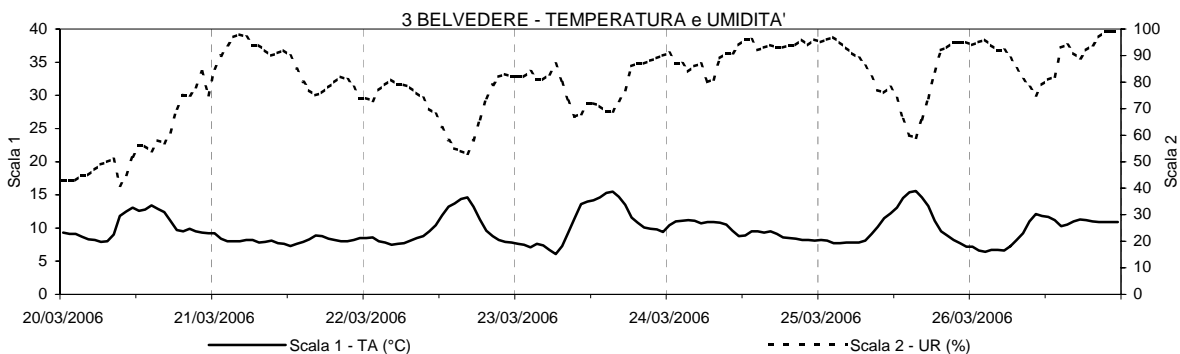
GENOVA -- 3 BELVEDERE ENEC periodo dal 08/03/06 al 08/08/06

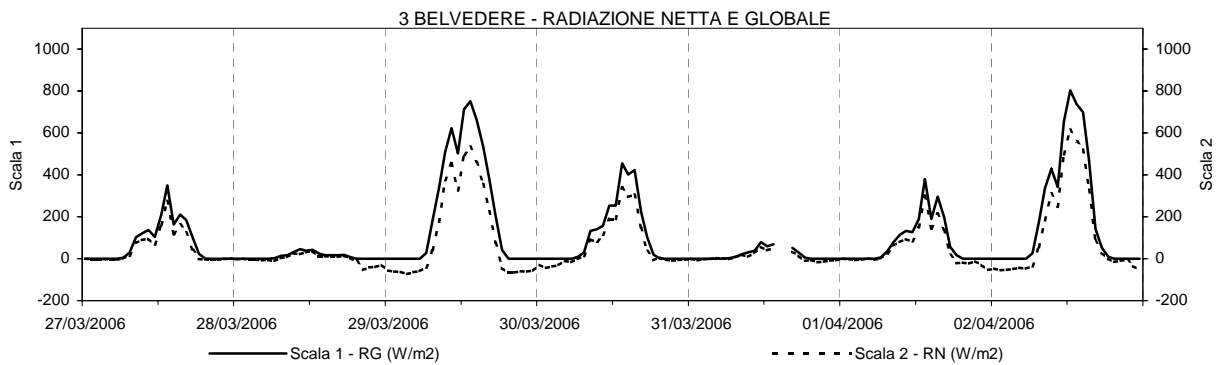
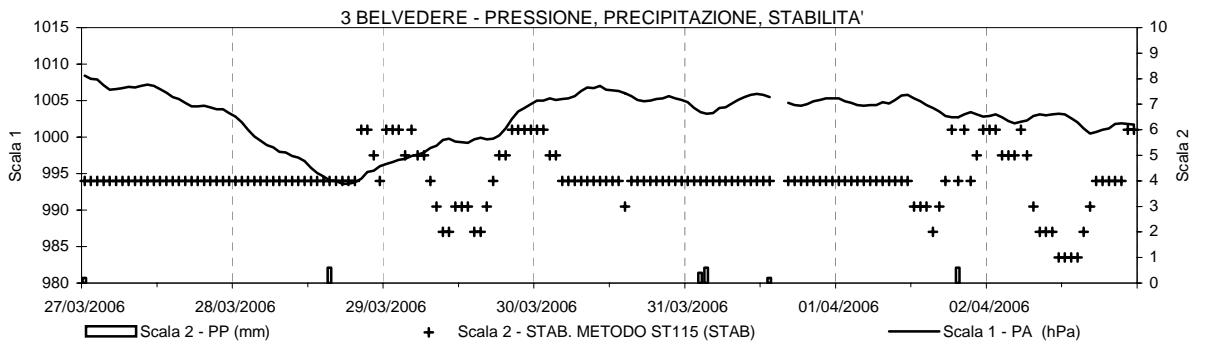
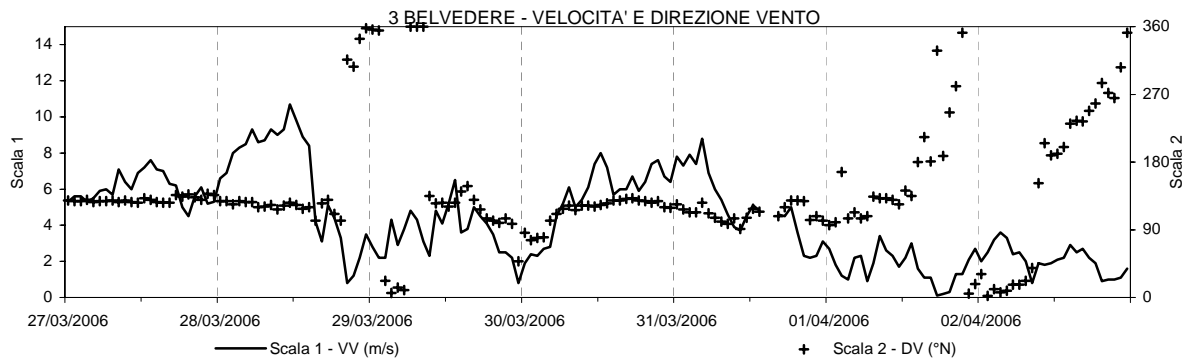
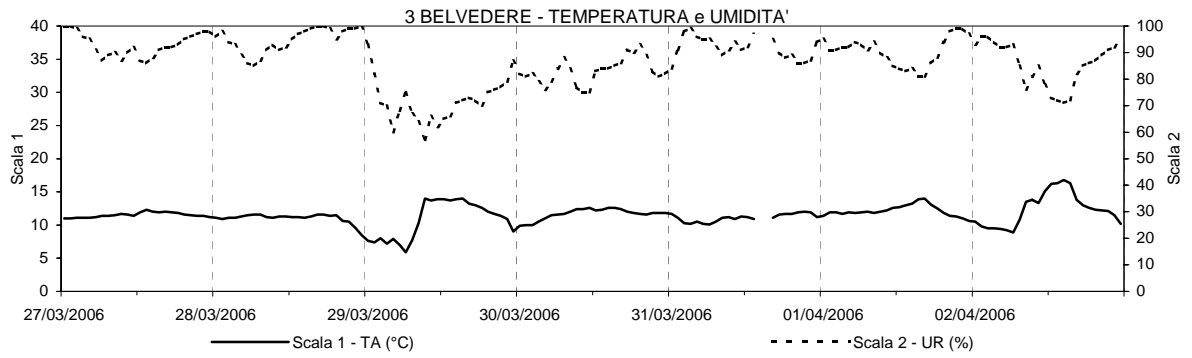
| Data | Ora | TA | UR | VV | VF | DV | SigDV | PA | PP | RN | RG | VVP | DP | SigDP | ST-115 | | |
|------|-----|----|------|------|-------|------|-------|-------|------|--------|--------|-------|-------|-------|--------|------|---|
| gg | mm | aa | (°C) | (%) | (m/s) | (km) | (°N) | (hPa) | (mm) | (W/m2) | (W/m2) | (m/s) | (°N) | (°) | (-) | | |
| 07 | 08 | 06 | 01 | 18.5 | 77 | 3.2 | 12.7 | 360 | 24.5 | 995.3 | 0.0 | -58.0 | 0.0 | 3.6 | 360 | 12.4 | 5 |
| 07 | 08 | 06 | 02 | 17.8 | 78 | 3.7 | 14.1 | 350 | 19.8 | 995.3 | 0.0 | -53.0 | 0.0 | 3.9 | 357 | 10.8 | 5 |
| 07 | 08 | 06 | 03 | 17.7 | 70 | 3.6 | 14.0 | 356 | 23.9 | 995.2 | 0.0 | -54.0 | 0.0 | 3.9 | 358 | 12.9 | 5 |
| 07 | 08 | 06 | 04 | 17.0 | 67 | 3.1 | 12.1 | 354 | 25.7 | 994.9 | 0.0 | -51.0 | 0.0 | 3.4 | 357 | 13.5 | 5 |
| 07 | 08 | 06 | 05 | 17.5 | 57 | 2.6 | 10.5 | 19 | 27.5 | 994.9 | 0.0 | -55.0 | 0.0 | 3.0 | 25 | 12.4 | 6 |
| 07 | 08 | 06 | 06 | 18.3 | 51 | 2.2 | 8.7 | 31 | 25.8 | 994.7 | 0.0 | -44.0 | 10.0 | 2.5 | 31 | 12.0 | 6 |
| 07 | 08 | 06 | 07 | 18.5 | 52 | 1.1 | 5.3 | 34 | 43.4 | 994.7 | 0.0 | -22.0 | 44.0 | 1.5 | 44 | 20.4 | 4 |
| 07 | 08 | 06 | 08 | 21.2 | 42 | 1.4 | 6.0 | 40 | 39.5 | 995.0 | 0.0 | -14.0 | 70.0 | 1.8 | 43 | 20.1 | 4 |
| 07 | 08 | 06 | 09 | 23.9 | 35 | 0.9 | 4.3 | 12 | 41.9 | 994.9 | 0.0 | 360.0 | 438.0 | 1.2 | 18 | 24.2 | 2 |
| 07 | 08 | 06 | 10 | 26.7 | 40 | 0.7 | 4.3 | 123 | 62.4 | 994.6 | 0.0 | 533.0 | 625.0 | 1.4 | 124 | 29.5 | 1 |
| 07 | 08 | 06 | 11 | 26.5 | 50 | 1.7 | 7.4 | 152 | 36.7 | 994.3 | 0.0 | 585.0 | 701.0 | 2.2 | 153 | 21.4 | 1 |
| 07 | 08 | 06 | 12 | 26.2 | 52 | 1.9 | 8.0 | 171 | 32.6 | 994.0 | 0.0 | 653.0 | 806.0 | 2.3 | 169 | 18.2 | 1 |
| 07 | 08 | 06 | 13 | 26.9 | 46 | 1.8 | 7.9 | 169 | 36.1 | 993.5 | 0.0 | 671.0 | 855.0 | 2.3 | 164 | 18.7 | 1 |
| 07 | 08 | 06 | 14 | 27.0 | 45 | 1.8 | 7.8 | 150 | 35.0 | 992.9 | 0.0 | 531.0 | 708.0 | 2.2 | 143 | 17.3 | 1 |
| 07 | 08 | 06 | 15 | 26.9 | 49 | 1.8 | 7.7 | 152 | 31.7 | 992.5 | 0.0 | 157.0 | 616.0 | 2.2 | 146 | 15.7 | 1 |
| 07 | 08 | 06 | 16 | 27.2 | 45 | 2.4 | 10.5 | 196 | 36.0 | 992.2 | 0.0 | 261.0 | 604.0 | 3.0 | 190 | 20.2 | 2 |
| 07 | 08 | 06 | 17 | 27.0 | 54 | 2.3 | 9.8 | 196 | 34.5 | 991.7 | 0.0 | -7.0 | 503.0 | 2.8 | 198 | 19.5 | 2 |
| 07 | 08 | 06 | 18 | 25.9 | 58 | 2.0 | 8.3 | 168 | 32.3 | 991.1 | 0.0 | 161.0 | 339.0 | 2.5 | 165 | 17.7 | 2 |
| 07 | 08 | 06 | 19 | 24.8 | 63 | 2.0 | 8.0 | 176 | 29.6 | 990.7 | 0.0 | 42.0 | 167.0 | 2.3 | 170 | 16.0 | 3 |
| 07 | 08 | 06 | 20 | 23.2 | 71 | 1.1 | 4.5 | 115 | 33.2 | 991.1 | 0.0 | -42.0 | 26.0 | 1.2 | 100 | 18.4 | 6 |
| 07 | 08 | 06 | 21 | 21.7 | 78 | 1.0 | 4.6 | 21 | 36.5 | 991.7 | 0.0 | -53.0 | 0.0 | 1.2 | 29 | 21.1 | 6 |
| 07 | 08 | 06 | 22 | 21.0 | 78 | 2.1 | 8.0 | 345 | 20.2 | 992.2 | 0.0 | -43.0 | 0.0 | 2.3 | 352 | 13.9 | 6 |
| 07 | 08 | 06 | 23 | 20.3 | 81 | 2.5 | 9.4 | 350 | 18.2 | 992.5 | 0.0 | -45.0 | 0.0 | 2.6 | 358 | 11.0 | 6 |
| 07 | 08 | 06 | 24 | 19.6 | 81 | 2.7 | 10.3 | 349 | 20.0 | 992.7 | 0.0 | -38.0 | 0.0 | 2.9 | 358 | 11.5 | 5 |
| 08 | 08 | 06 | 01 | 19.3 | 78 | 2.9 | 10.9 | 350 | 18.6 | 992.7 | 0.0 | -28.0 | 0.0 | 3.0 | 356 | 12.7 | 5 |
| 08 | 08 | 06 | 02 | 19.1 | 74 | 2.9 | 11.1 | 351 | 21.7 | 992.6 | 0.0 | -34.0 | 0.0 | 3.1 | 356 | 12.8 | 5 |
| 08 | 08 | 06 | 03 | 18.7 | 74 | 3.0 | 11.7 | 350 | 21.3 | 992.4 | 0.0 | -29.0 | 0.0 | 3.3 | 355 | 13.2 | 4 |
| 08 | 08 | 06 | 04 | 18.3 | 74 | 3.2 | 12.2 | 347 | 21.5 | 992.4 | 0.0 | -36.0 | 0.0 | 3.4 | 353 | 14.6 | 4 |
| 08 | 08 | 06 | 05 | 17.7 | 76 | 3.5 | 13.5 | 348 | 22.6 | 992.3 | 0.0 | -34.0 | 0.0 | 3.8 | 354 | 12.6 | 4 |
| 08 | 08 | 06 | 06 | 17.9 | 65 | 2.9 | 12.2 | 359 | 31.8 | 992.4 | 0.0 | -26.0 | 13.0 | 3.5 | 357 | 16.3 | 5 |
| 08 | 08 | 06 | 07 | 18.4 | 57 | 2.8 | 11.8 | 3 | 32.7 | 992.4 | 0.0 | 2.0 | 56.0 | 3.4 | 4 | 16.3 | 4 |
| 08 | 08 | 06 | 08 | 19.6 | 54 | 2.5 | 10.1 | 4 | 29.6 | 992.6 | 0.0 | 60.0 | 129.0 | 2.9 | 2 | 14.4 | 4 |
| 08 | 08 | 06 | 09 | 21.4 | 49 | 1.9 | 7.6 | 354 | 25.7 | 992.9 | 0.0 | 252.0 | 313.0 | 2.2 | 352 | 15.7 | 2 |
| 08 | 08 | 06 | 10 | 24.9 | 51 | 0.7 | 5.9 | 111 | 65.8 | 993.0 | 0.0 | 397.0 | 486.0 | 1.6 | 1000 | 0.0 | 2 |

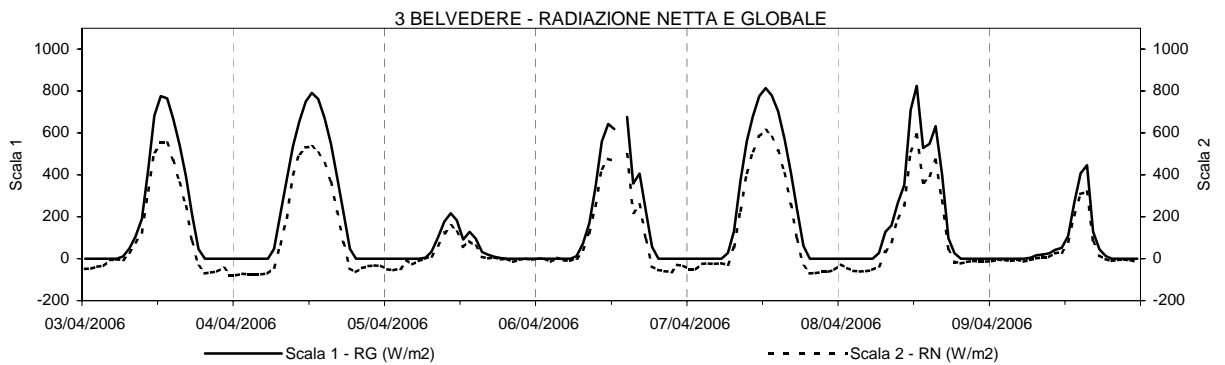
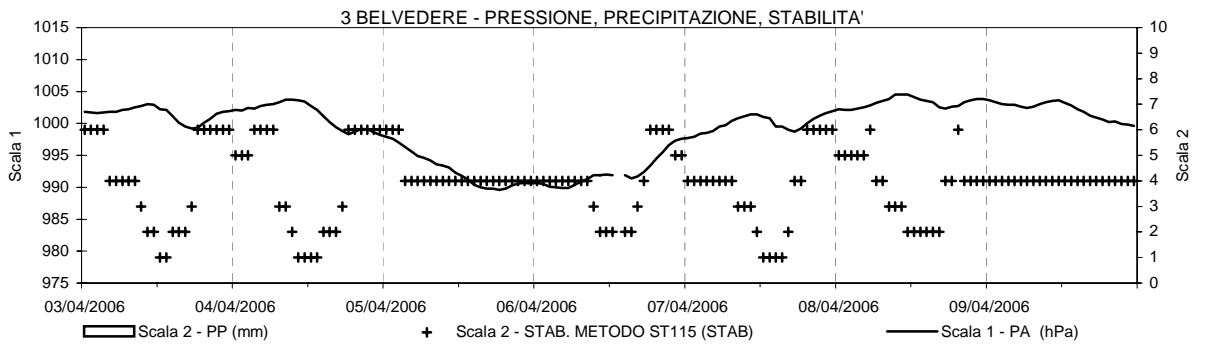
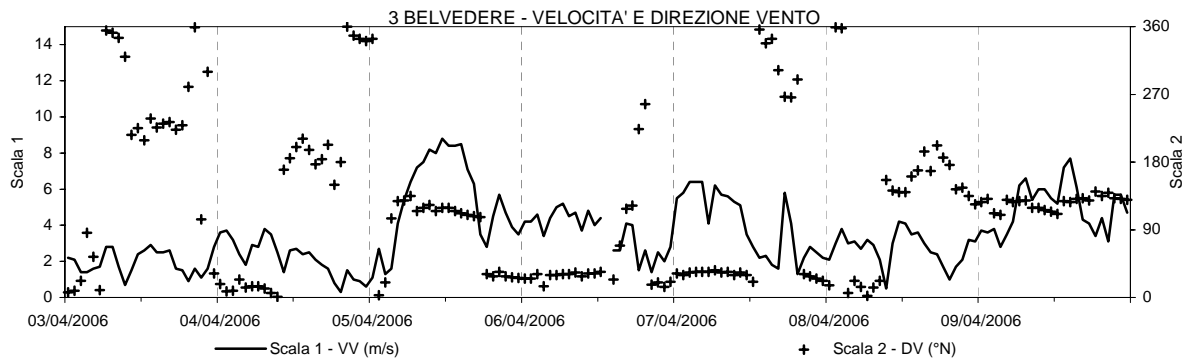
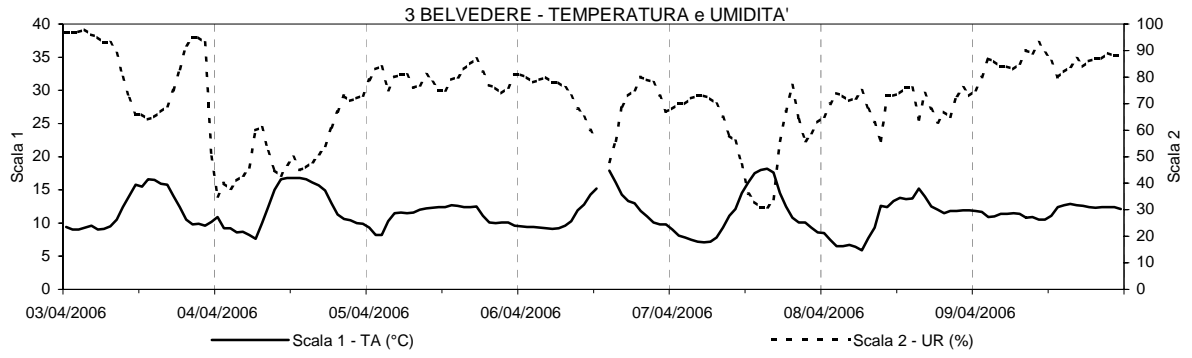
4.2 Andamenti temporali

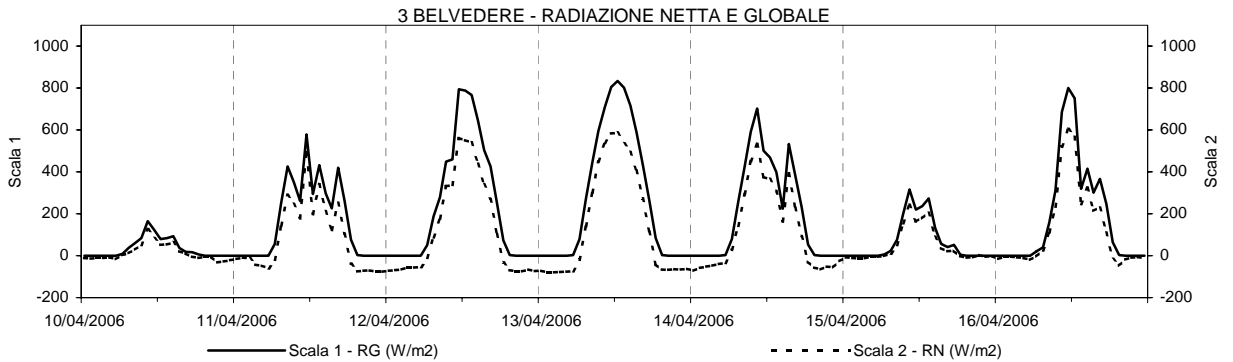
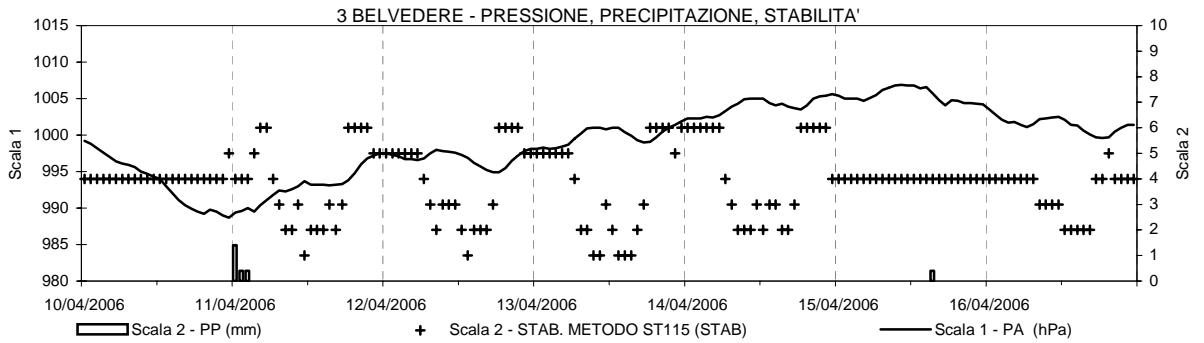
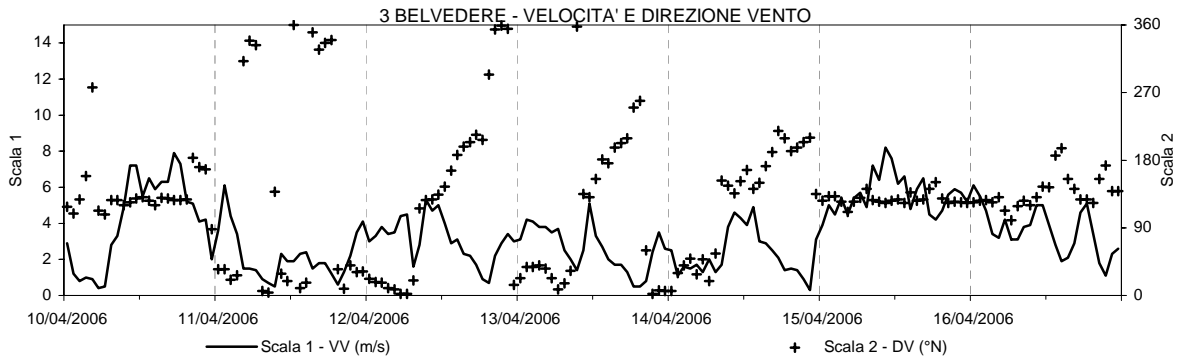
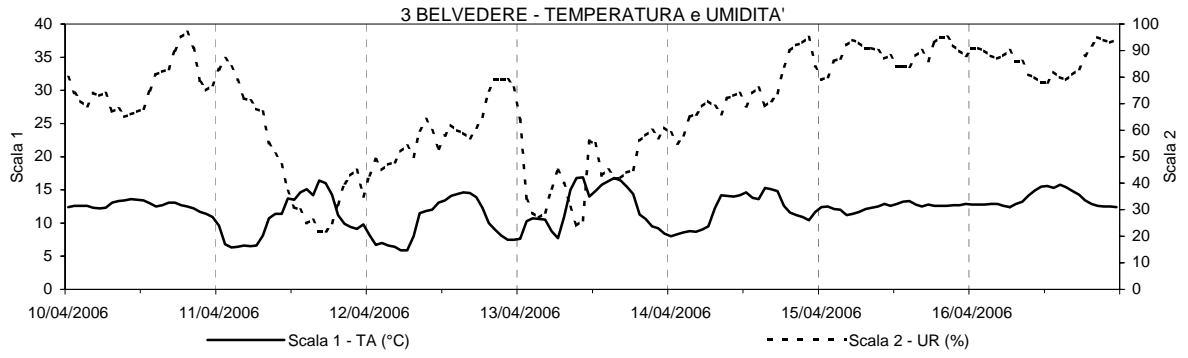


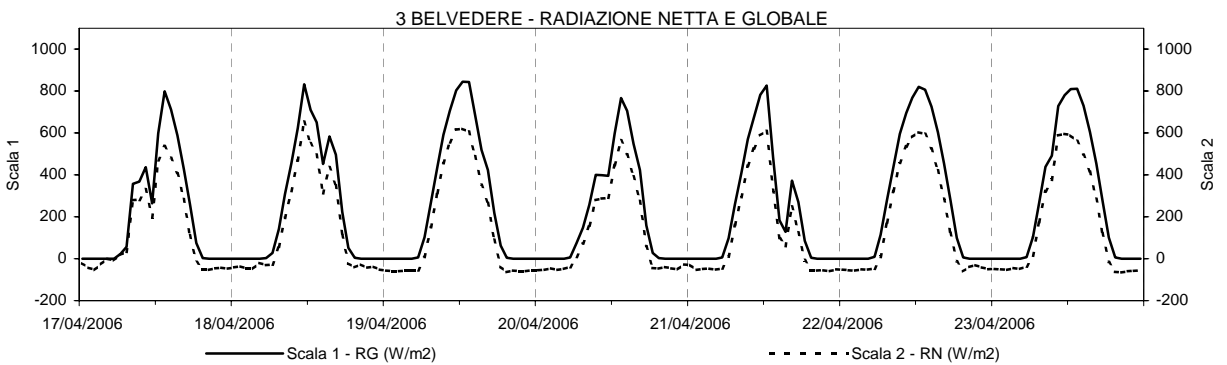
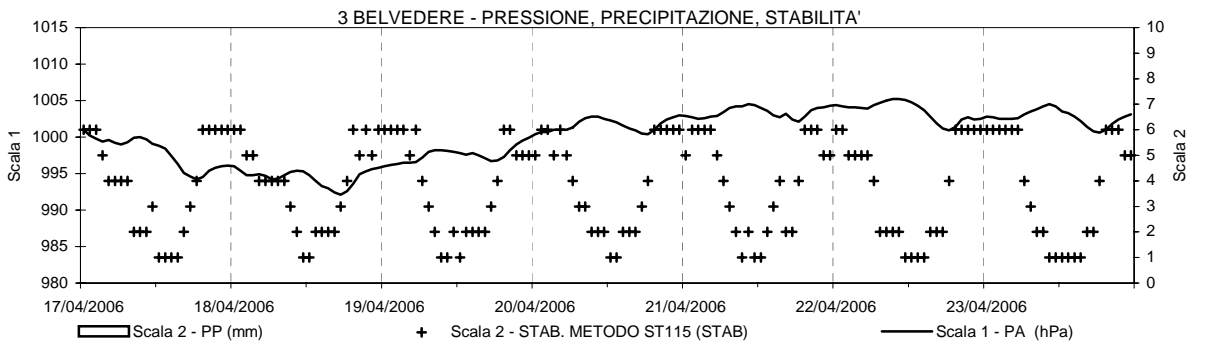
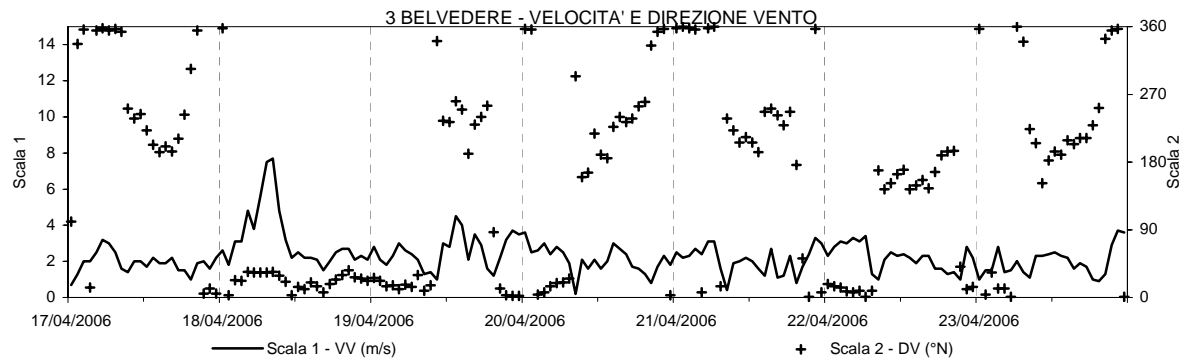
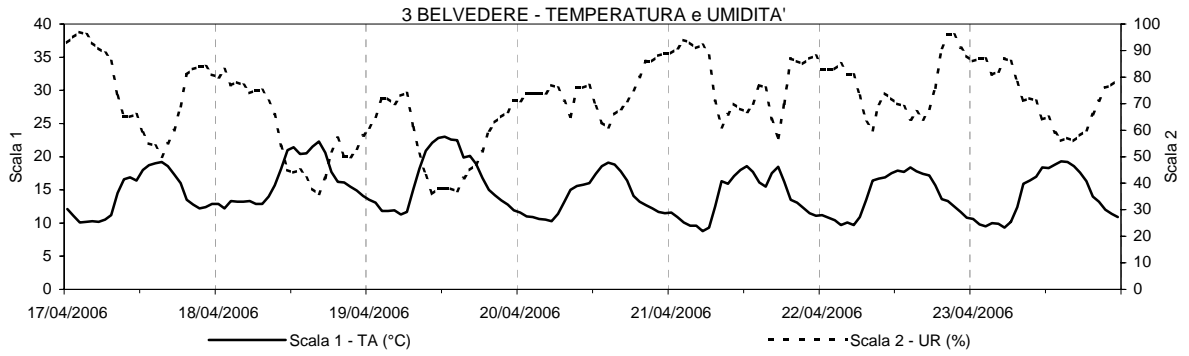


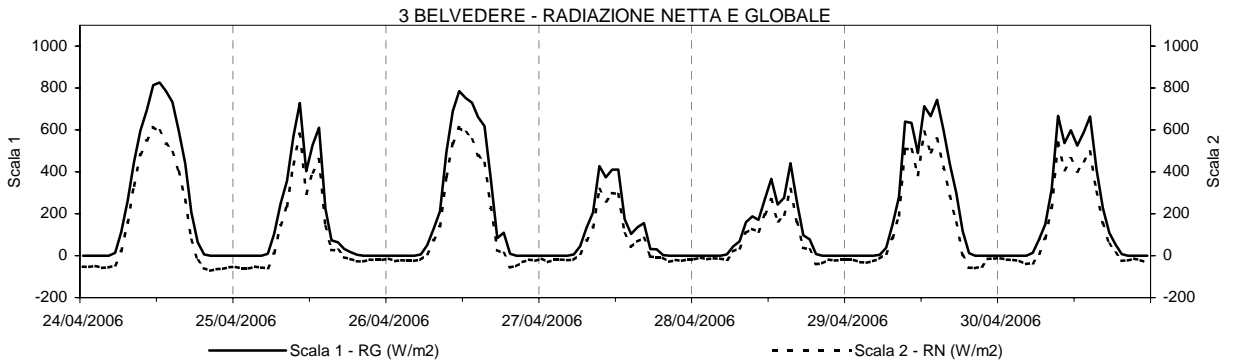
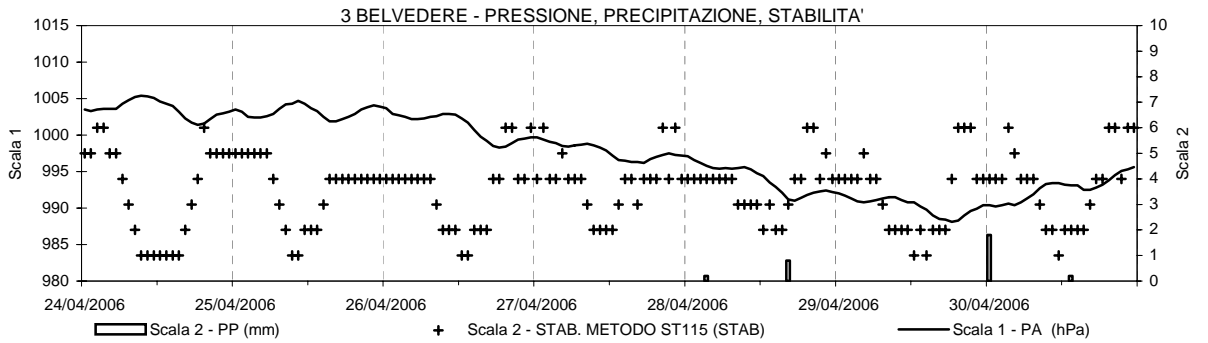
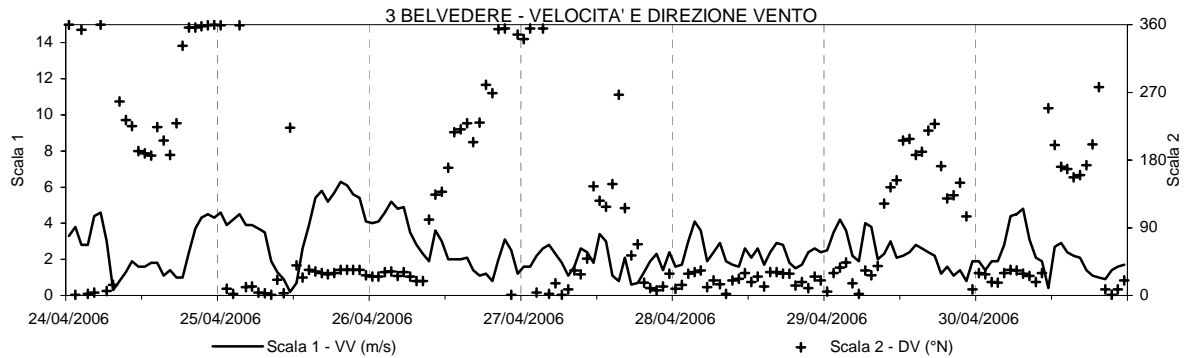
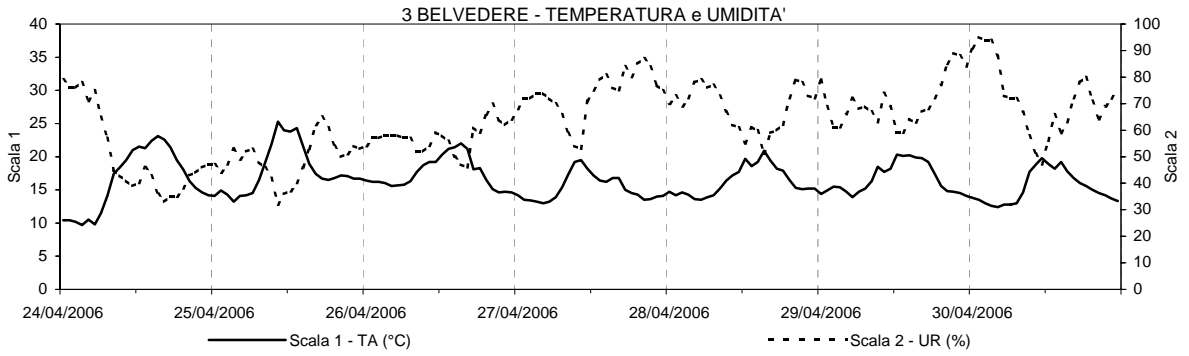


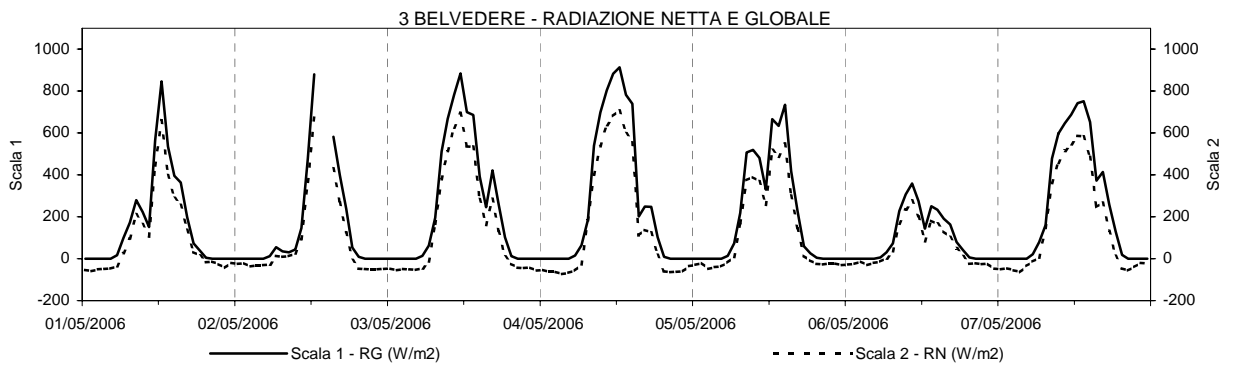
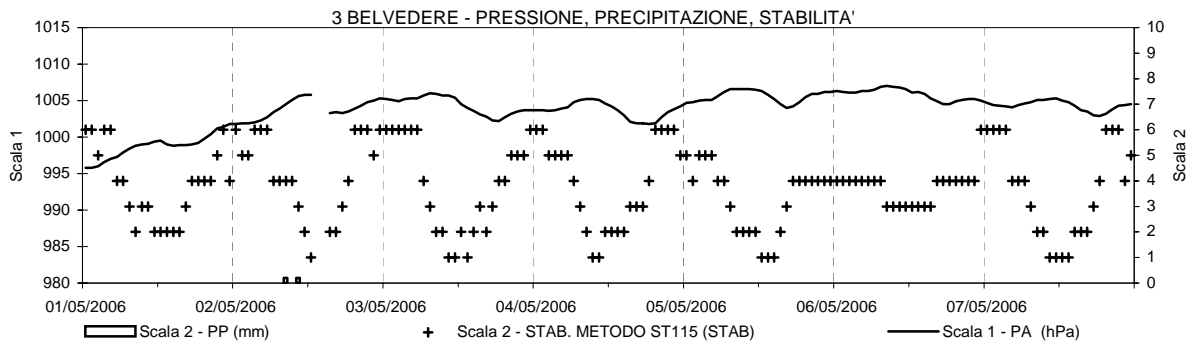
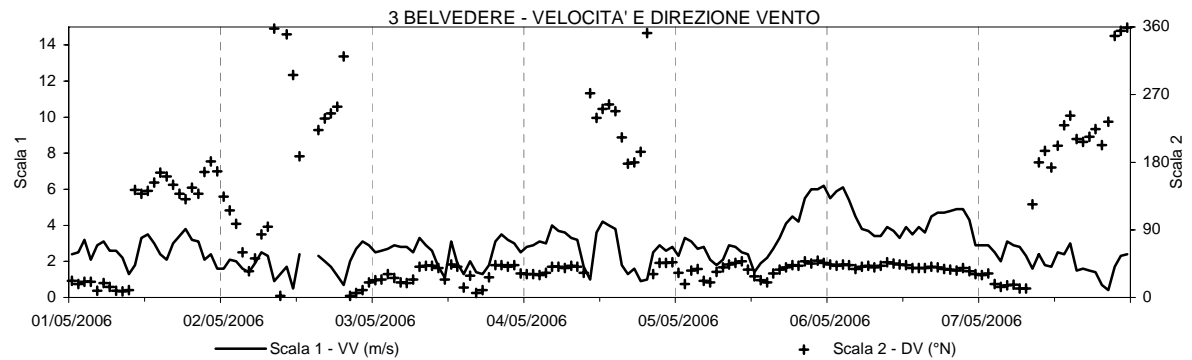
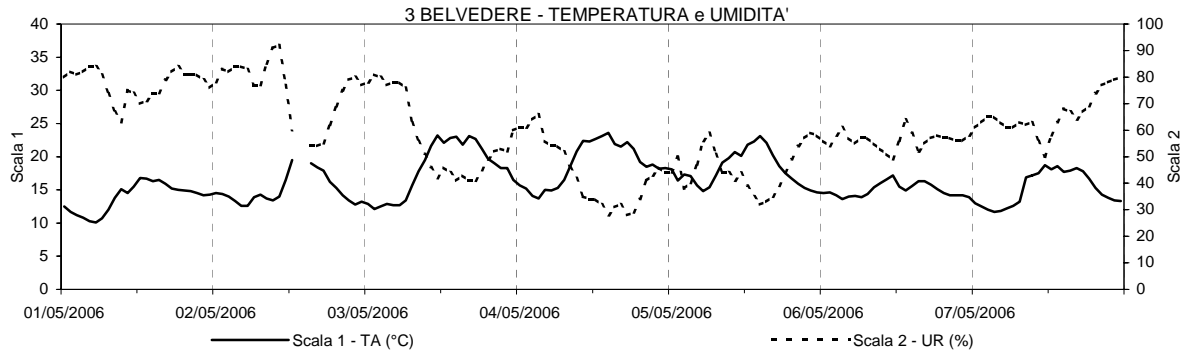


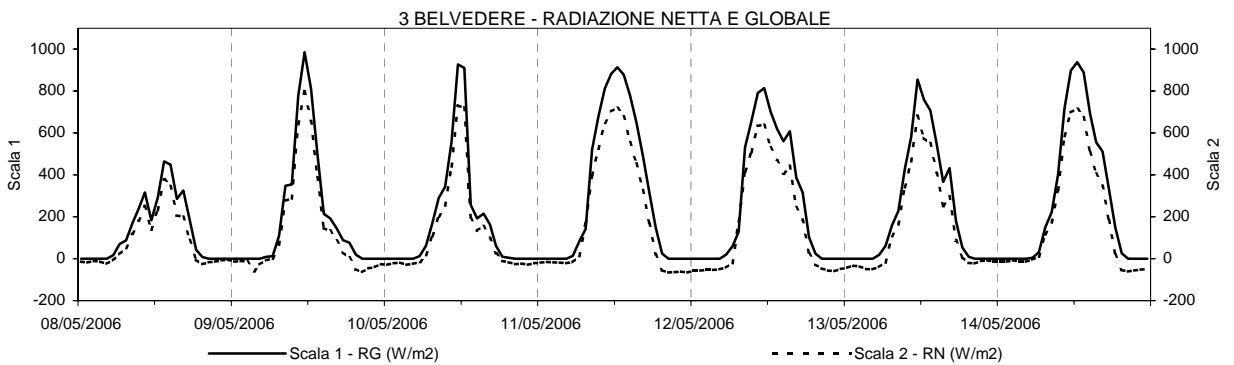
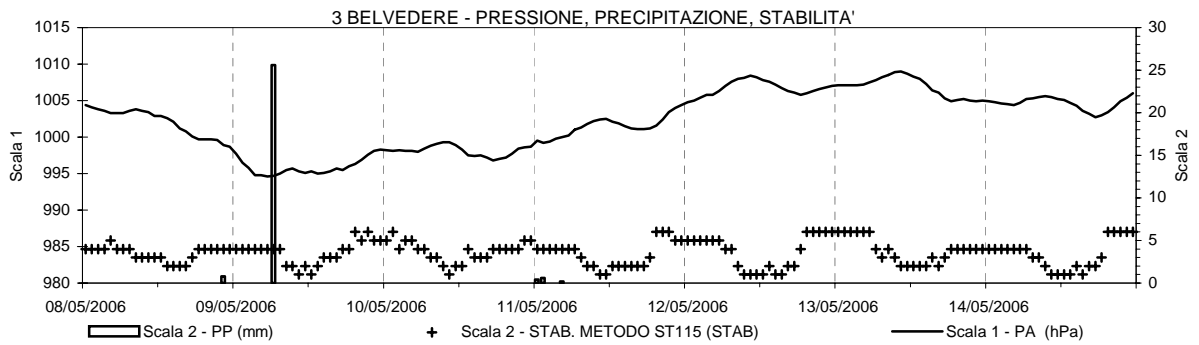
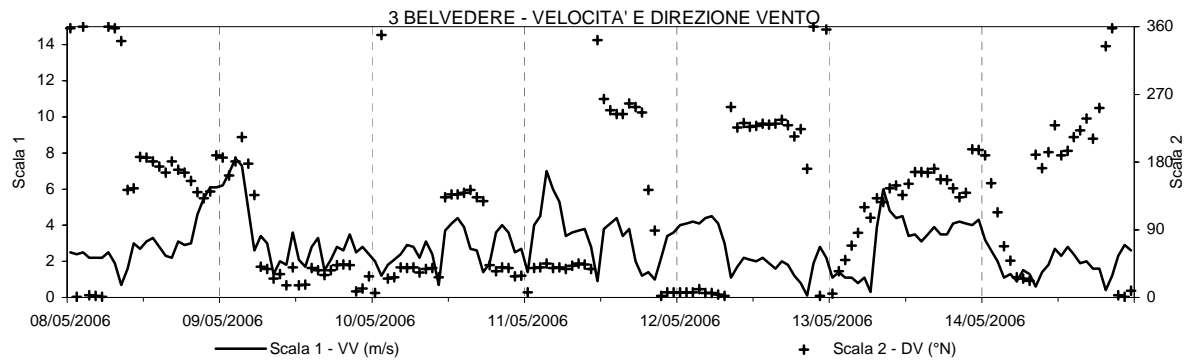
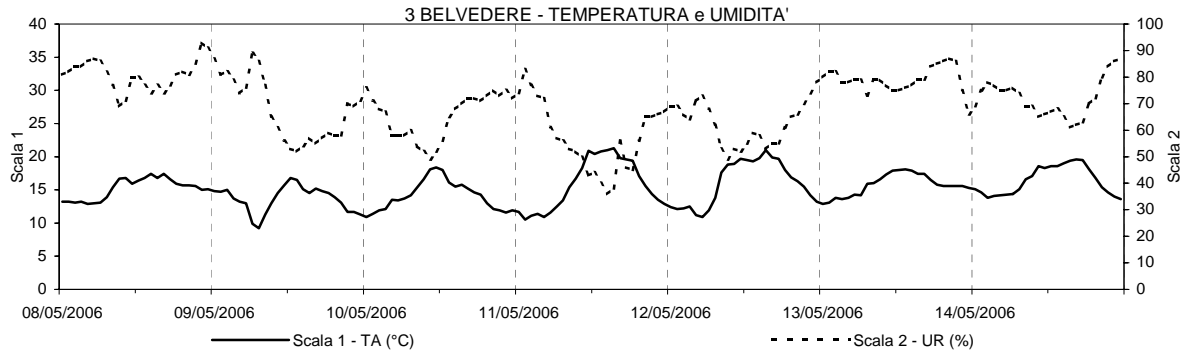


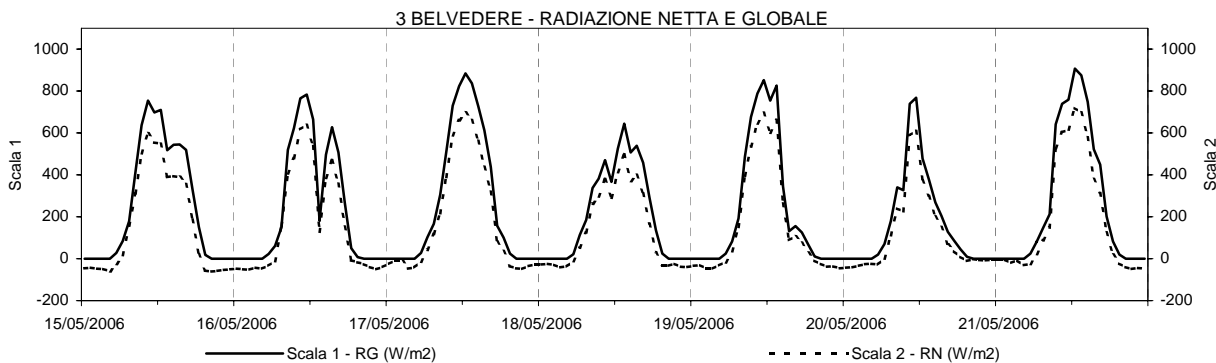
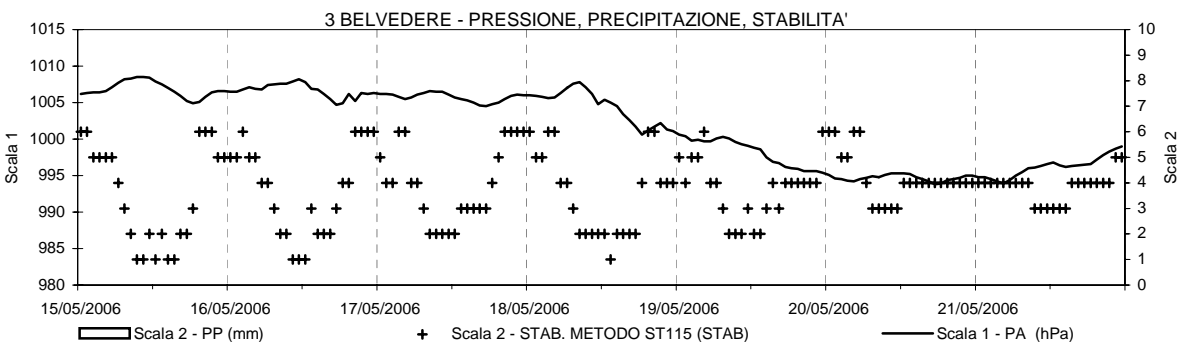
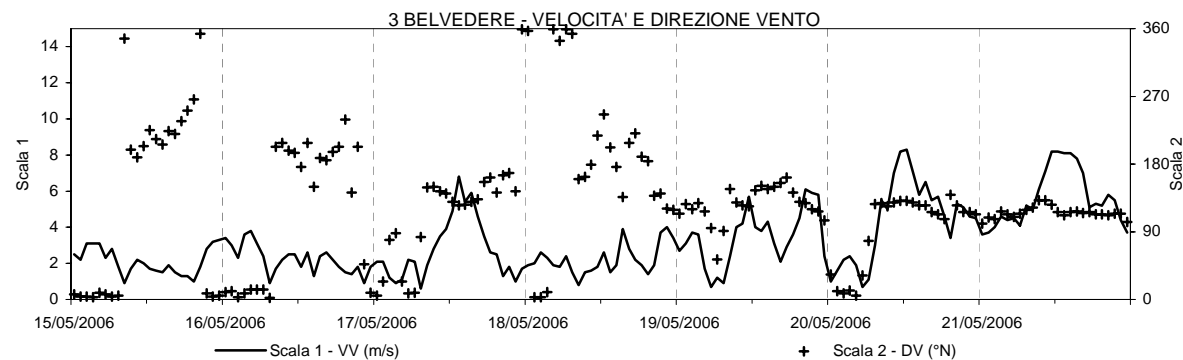
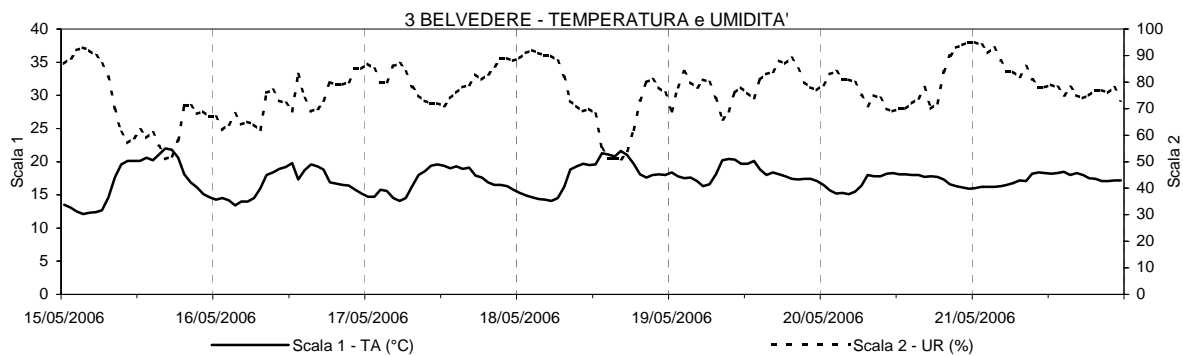


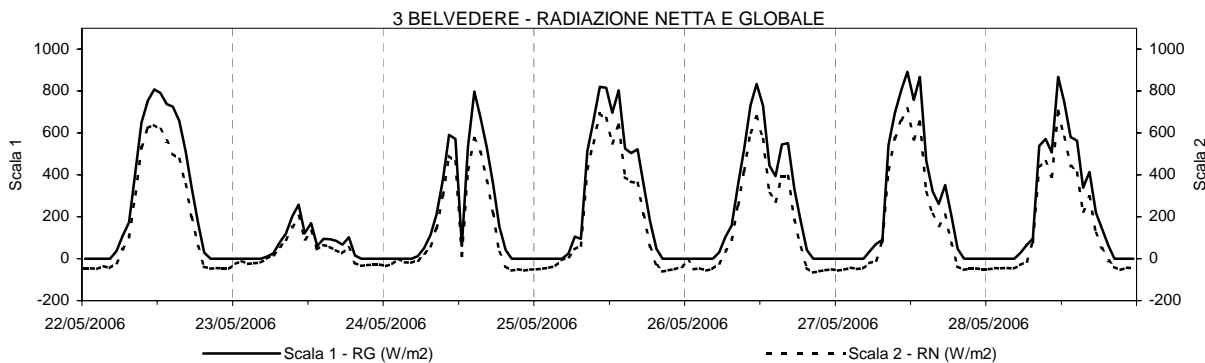
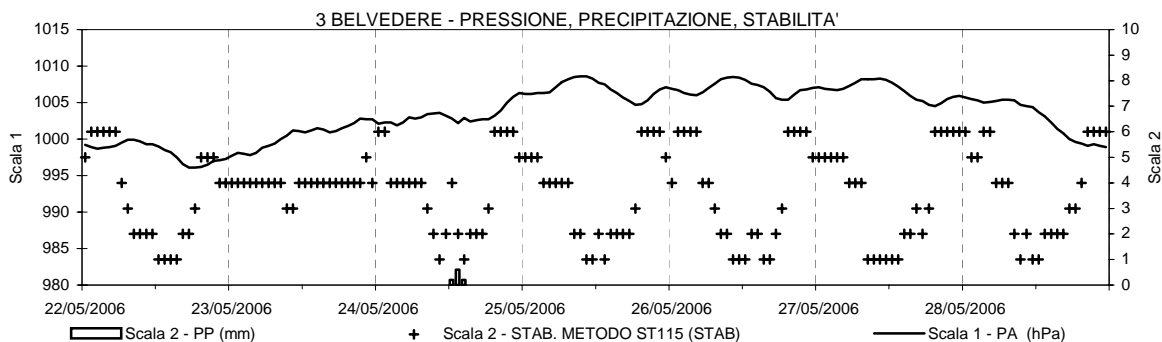
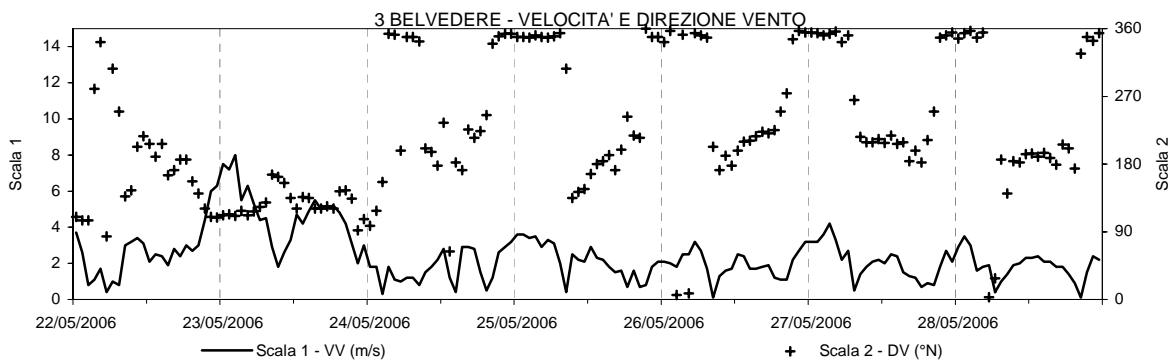
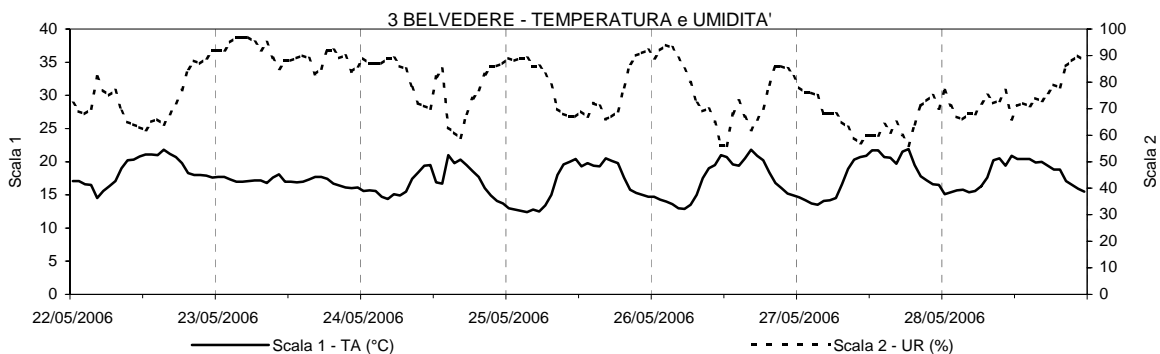


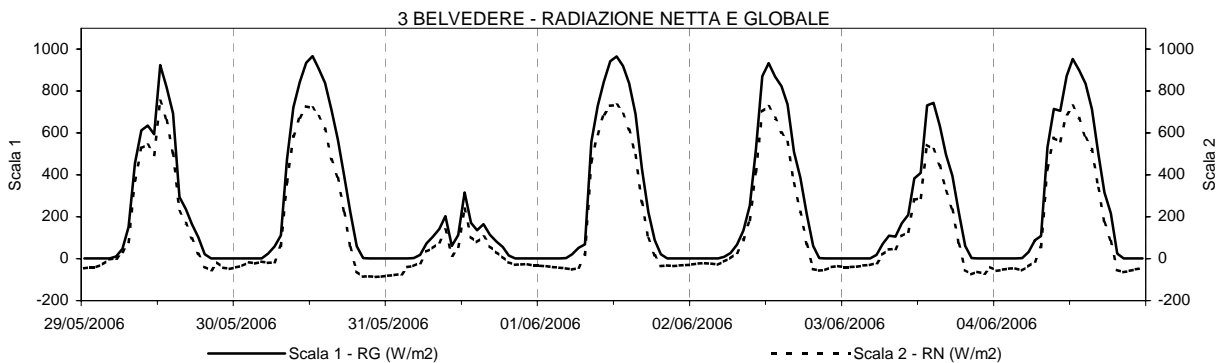
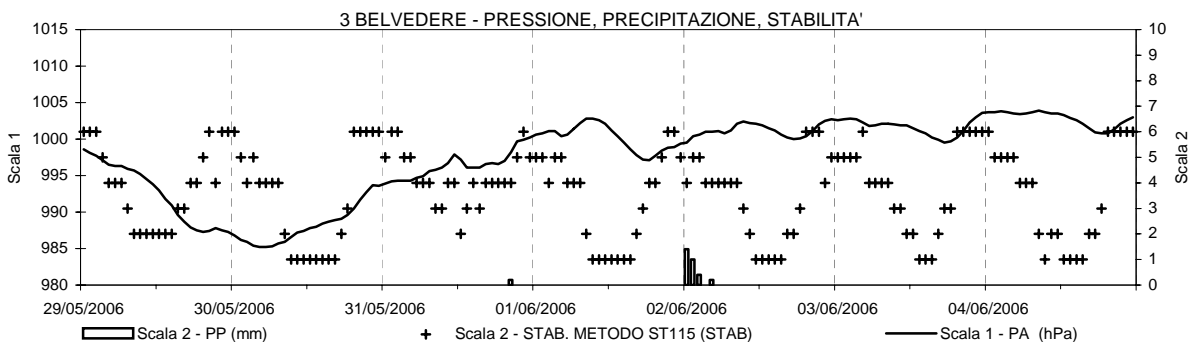
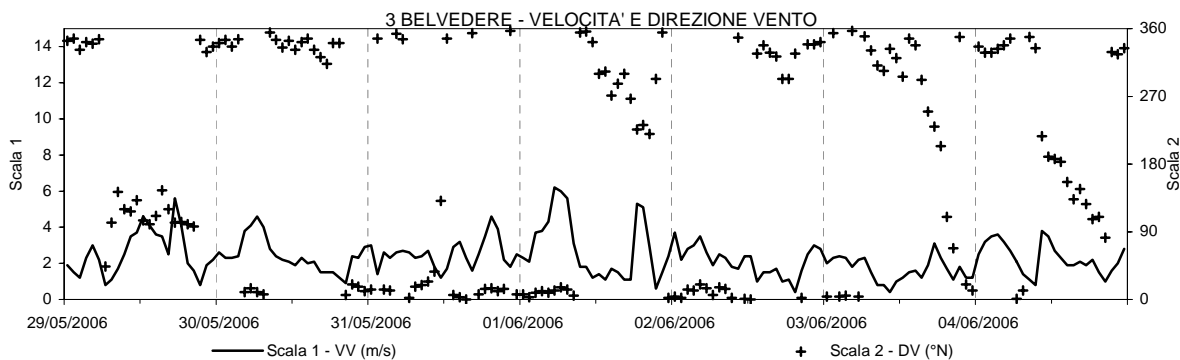
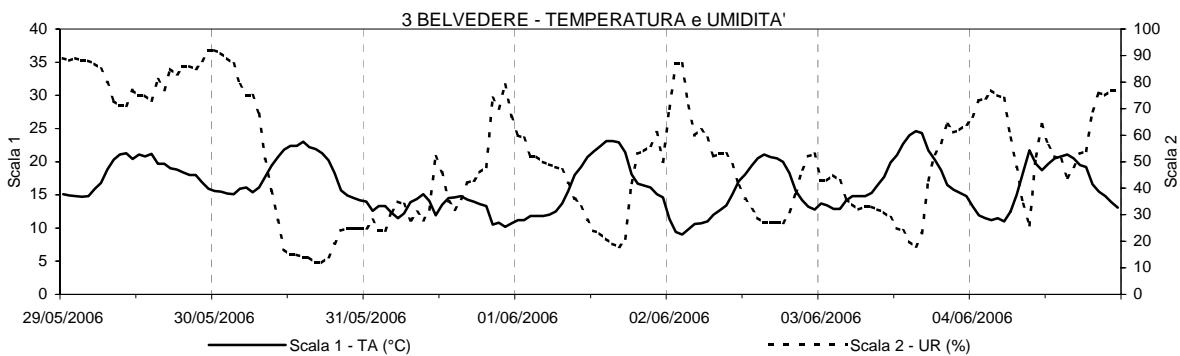


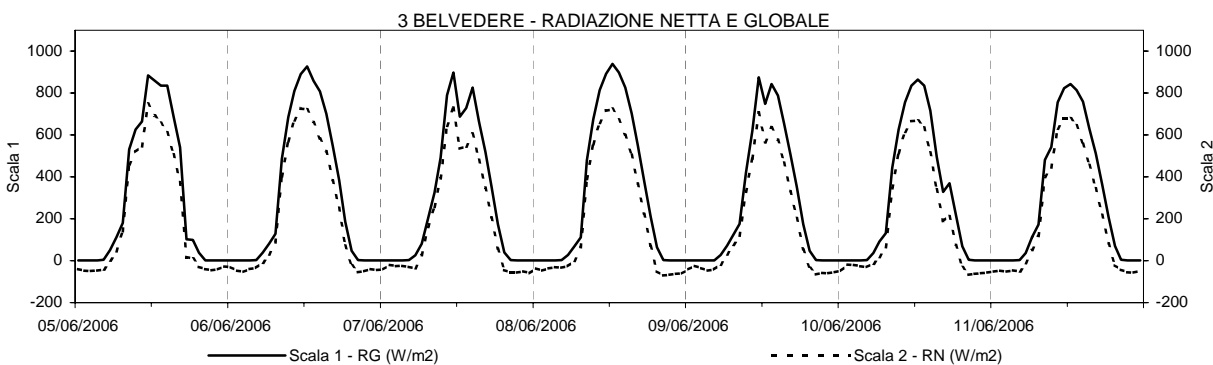
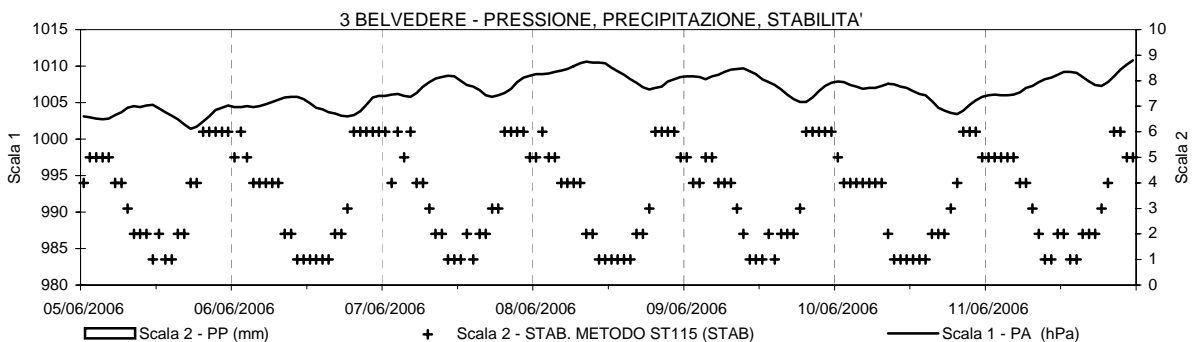
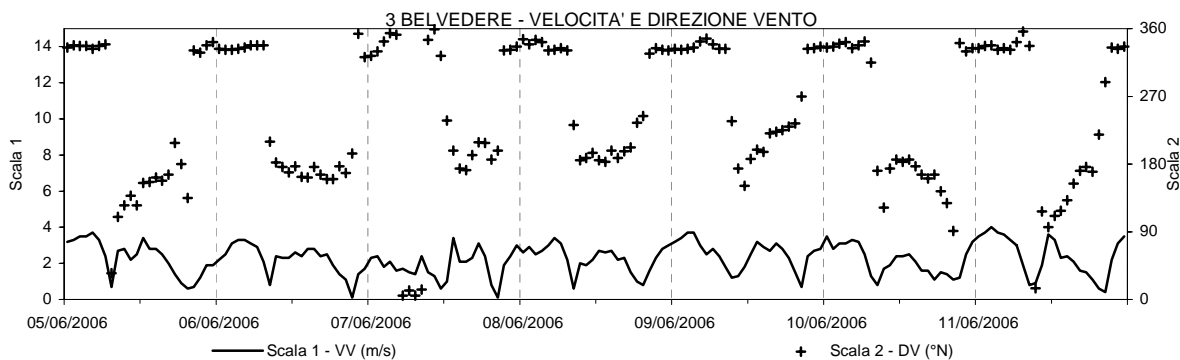
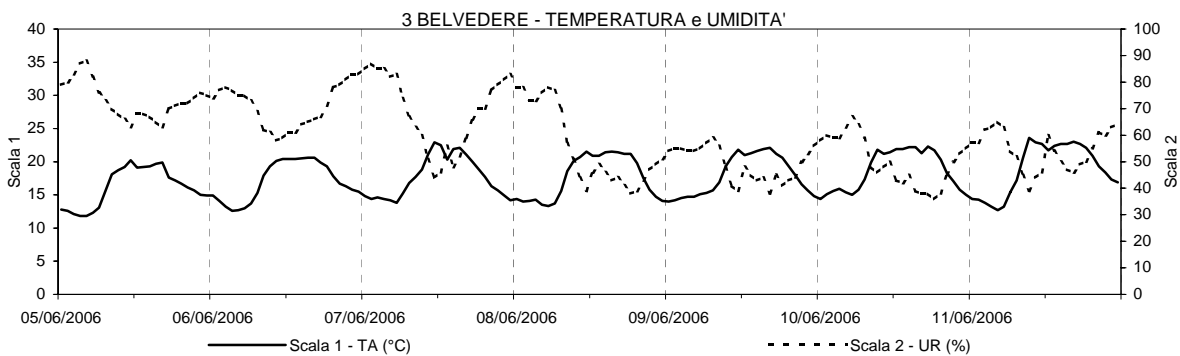


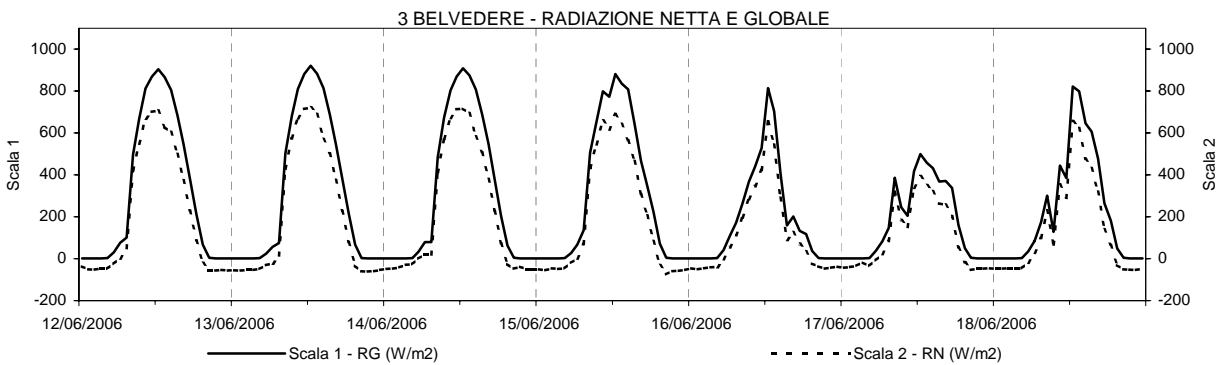
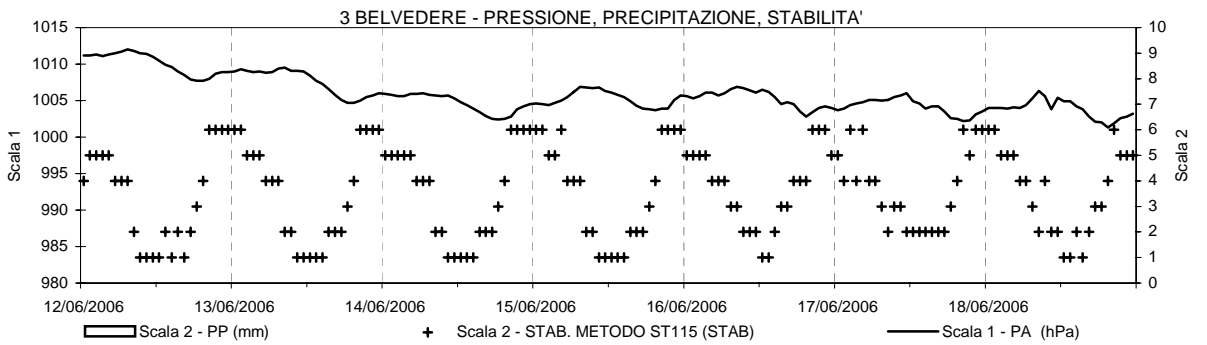
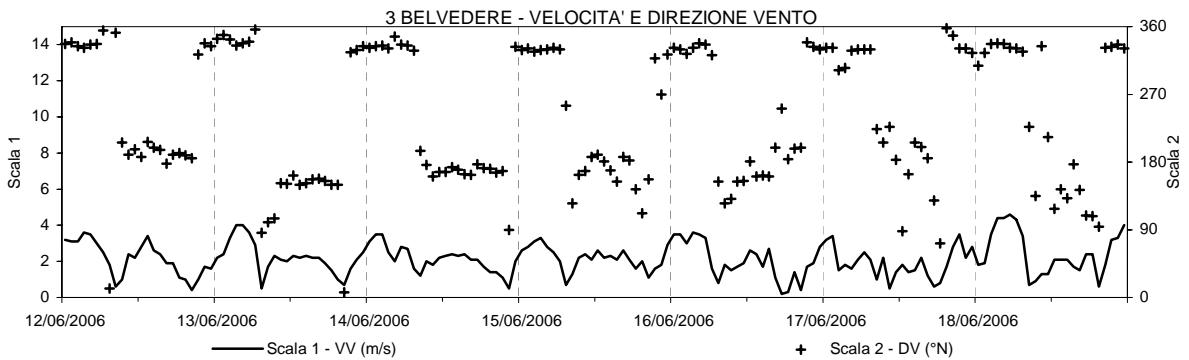
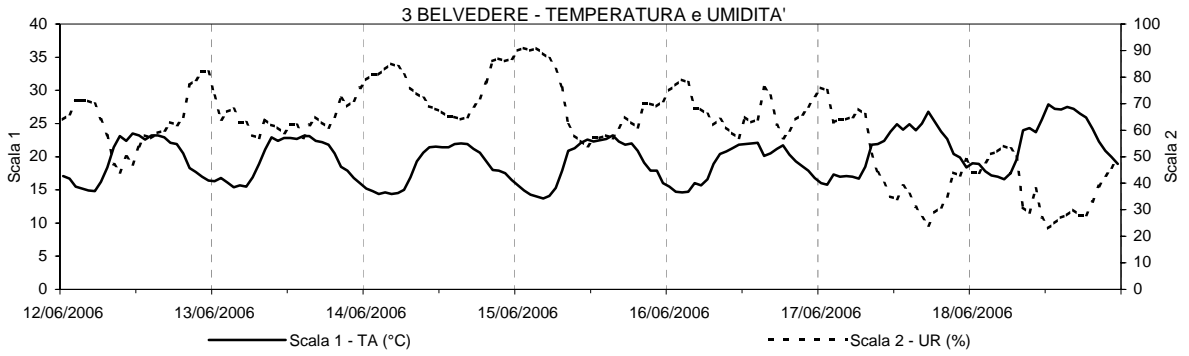


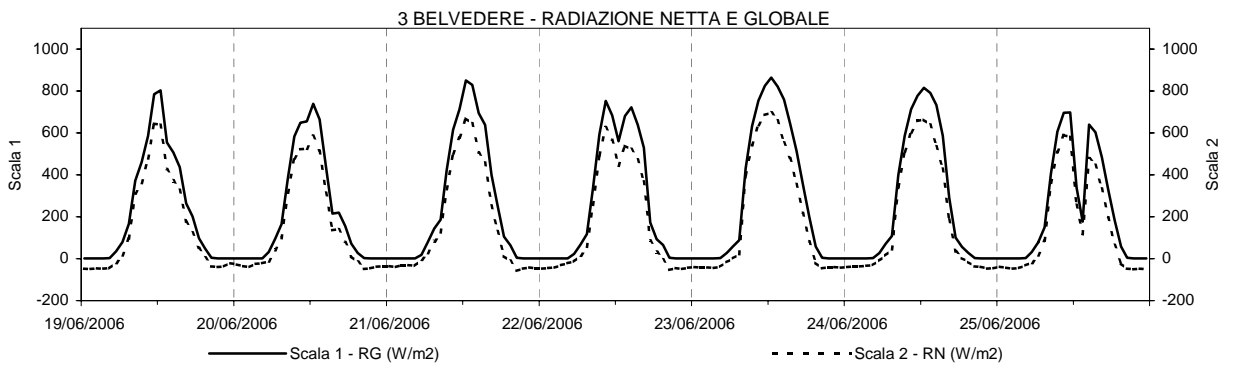
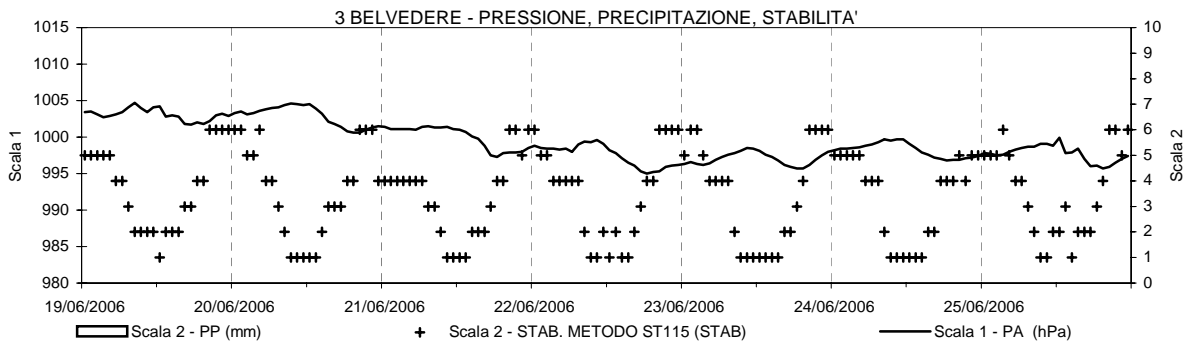
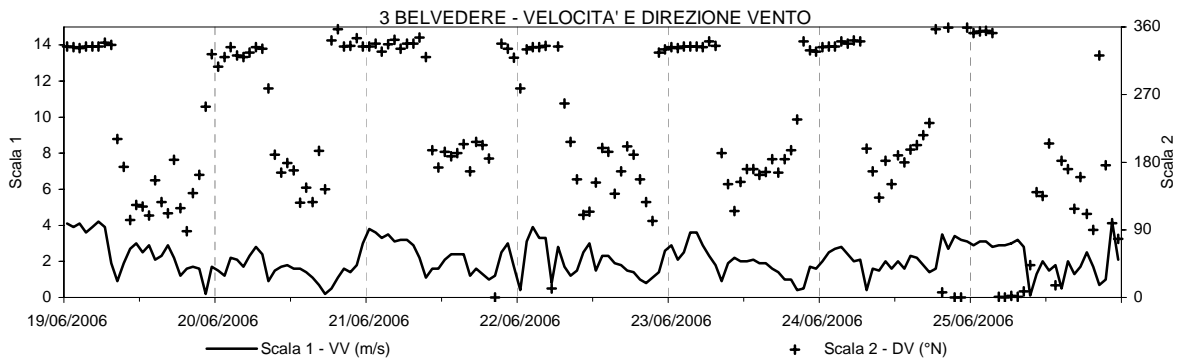
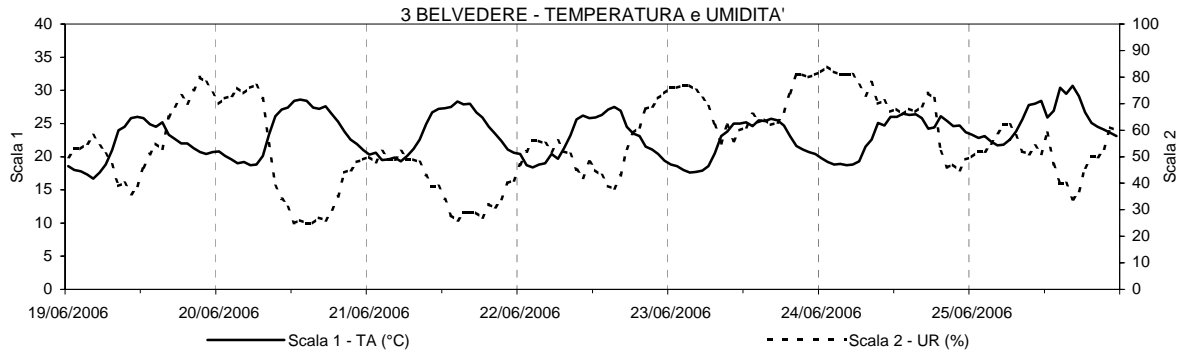


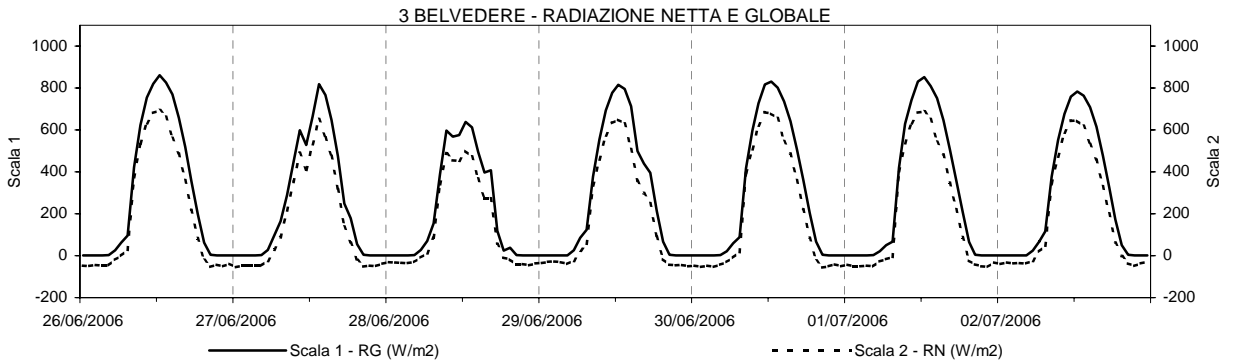
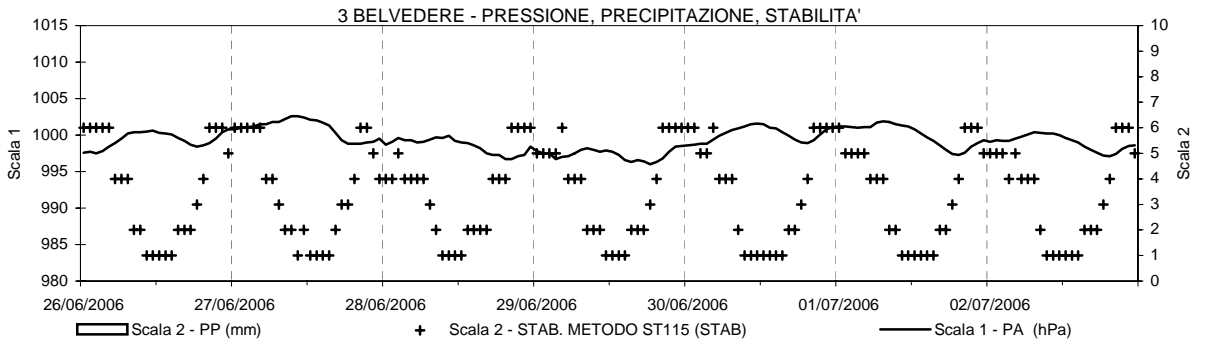
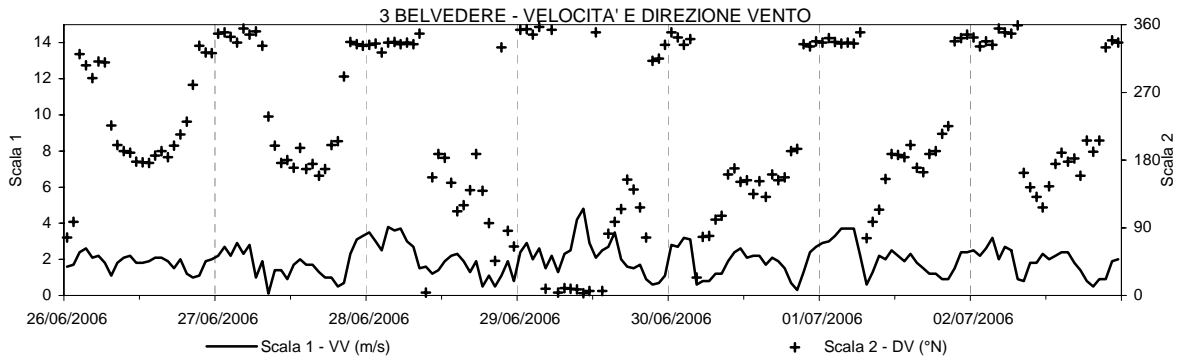
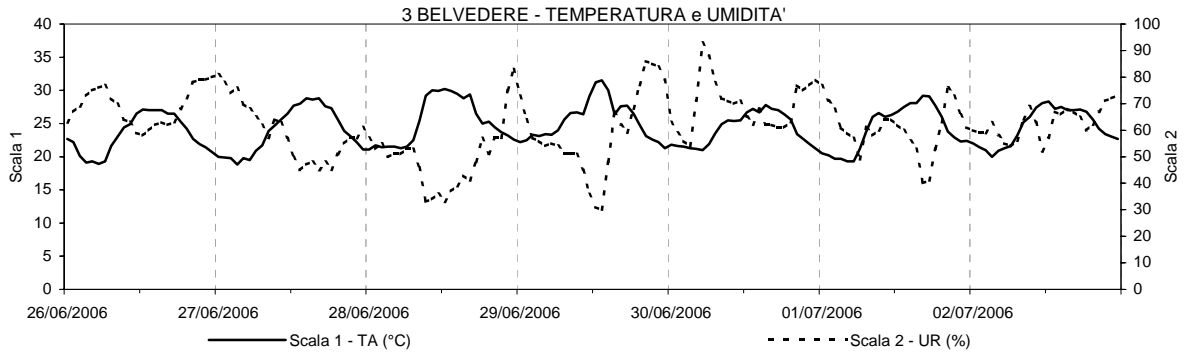


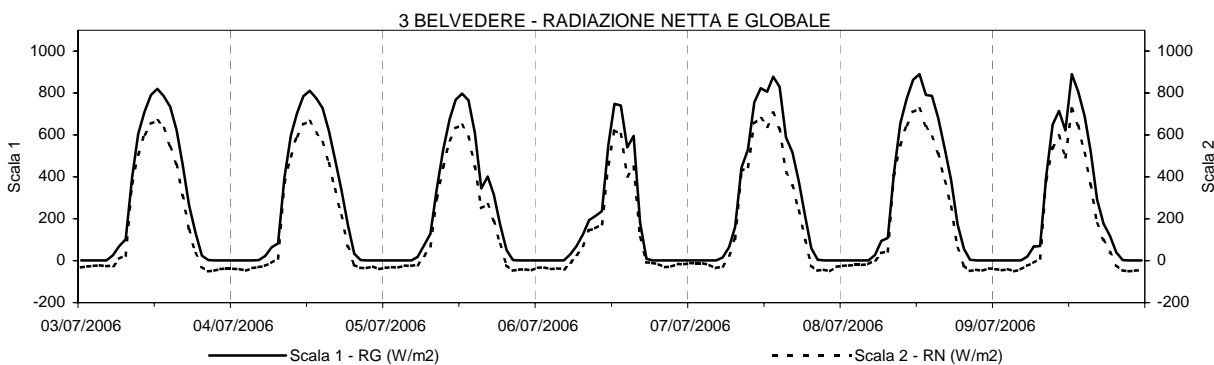
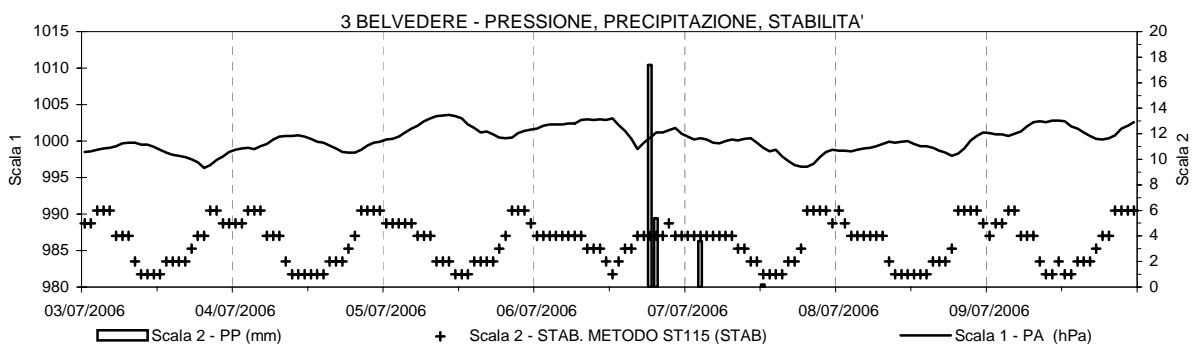
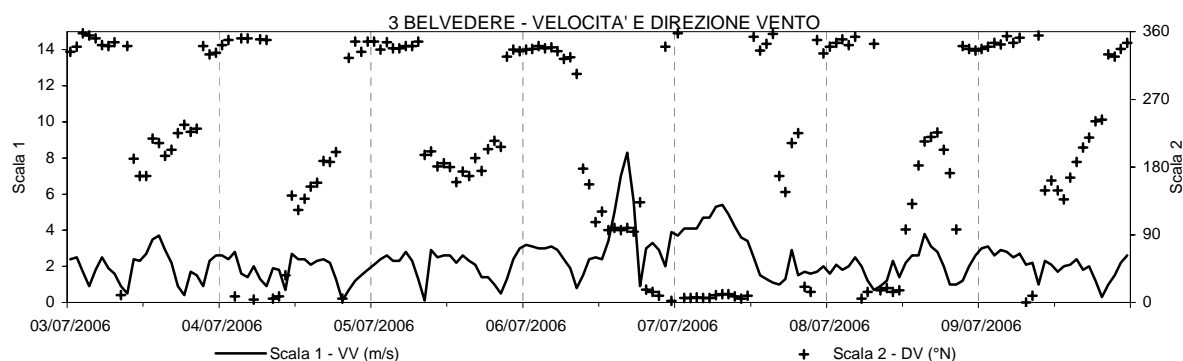
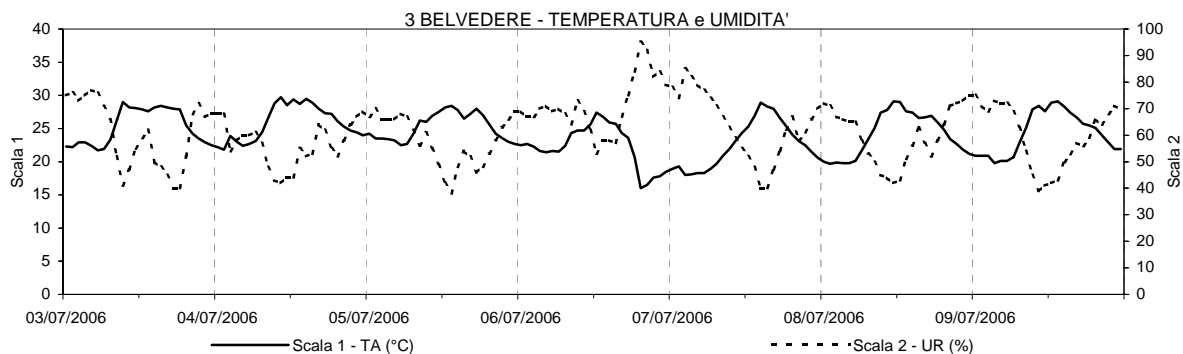


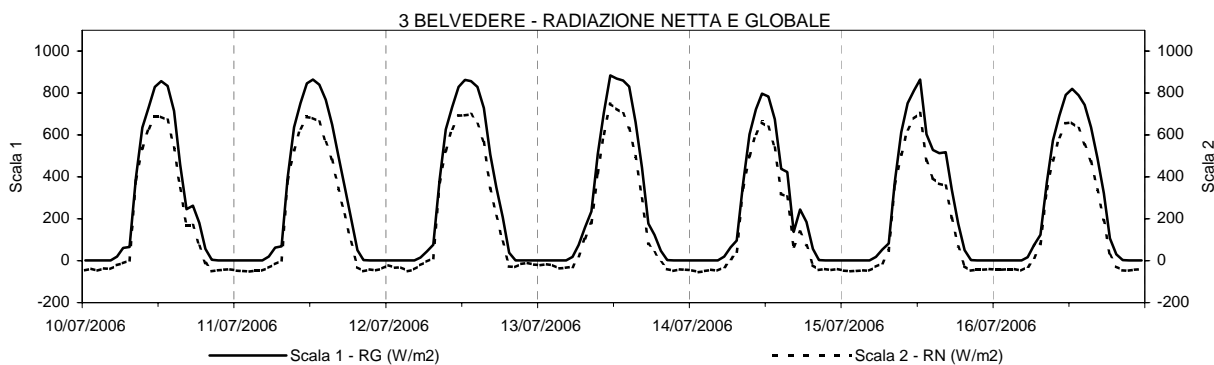
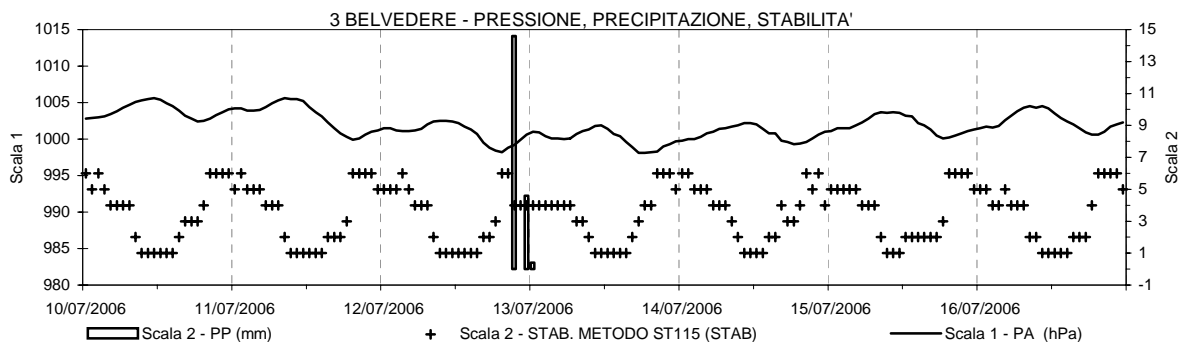
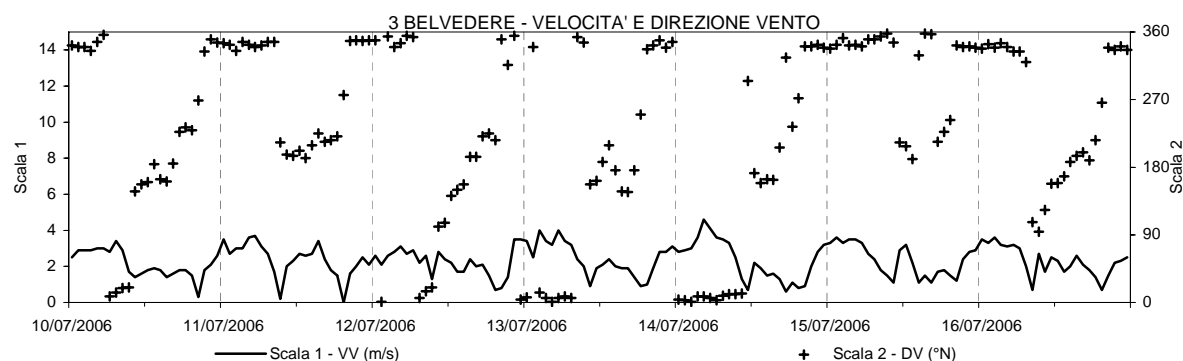
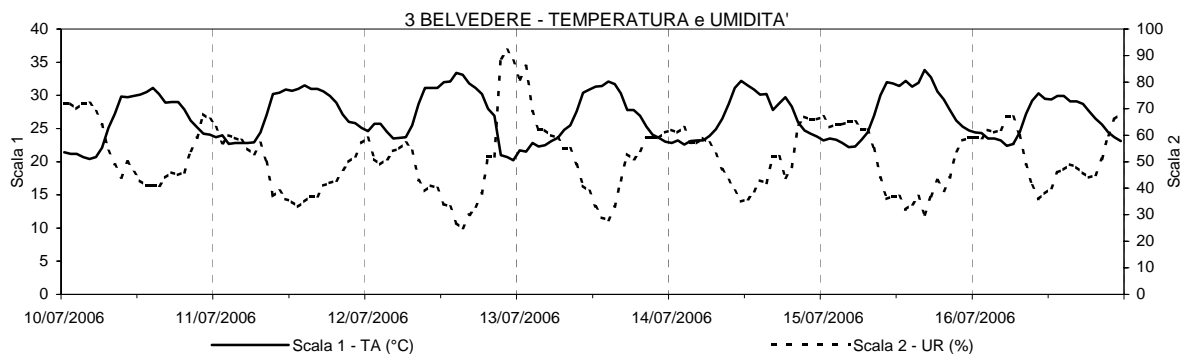


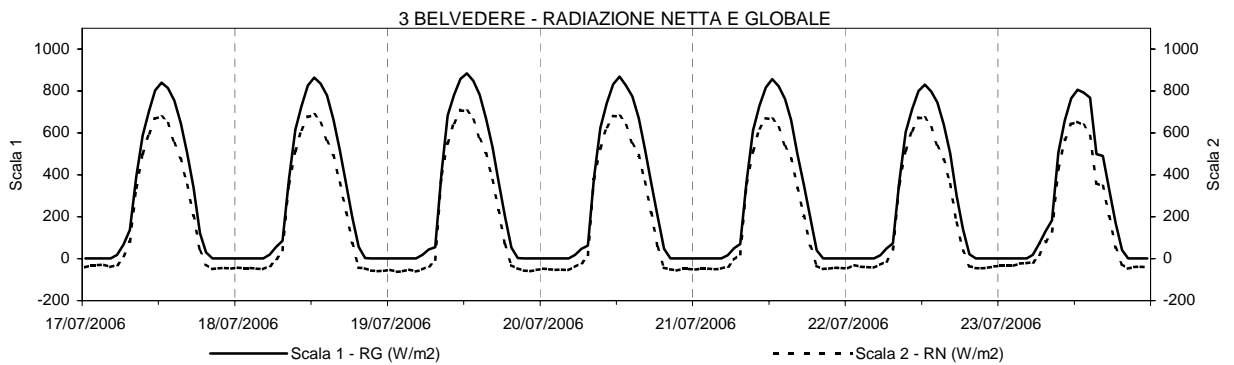
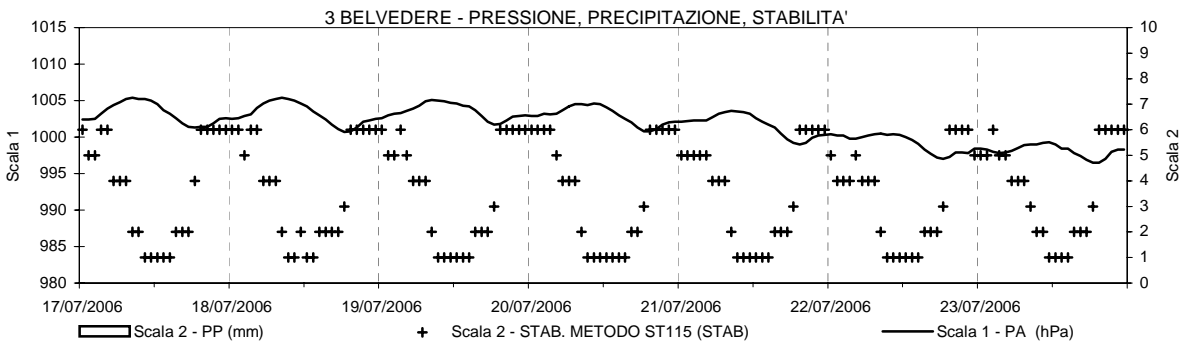
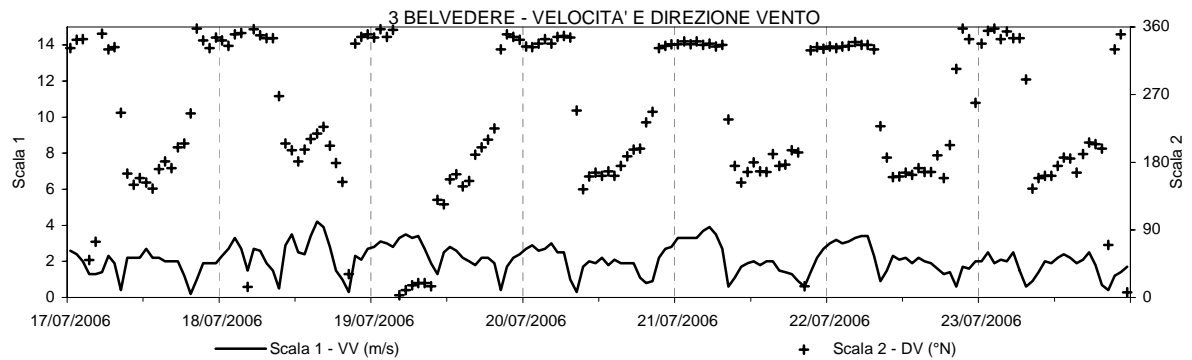
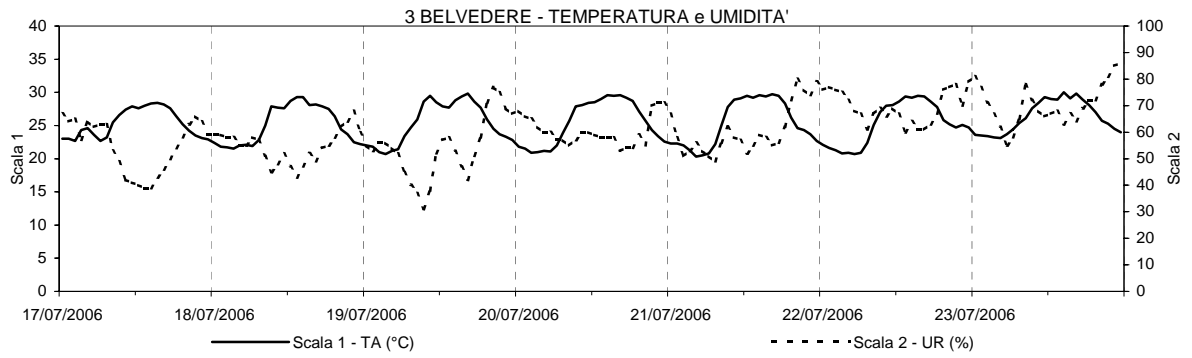


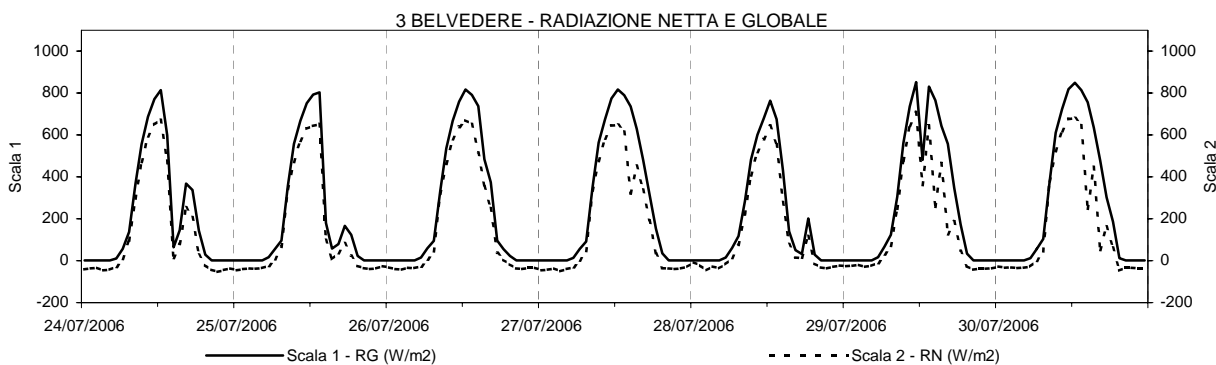
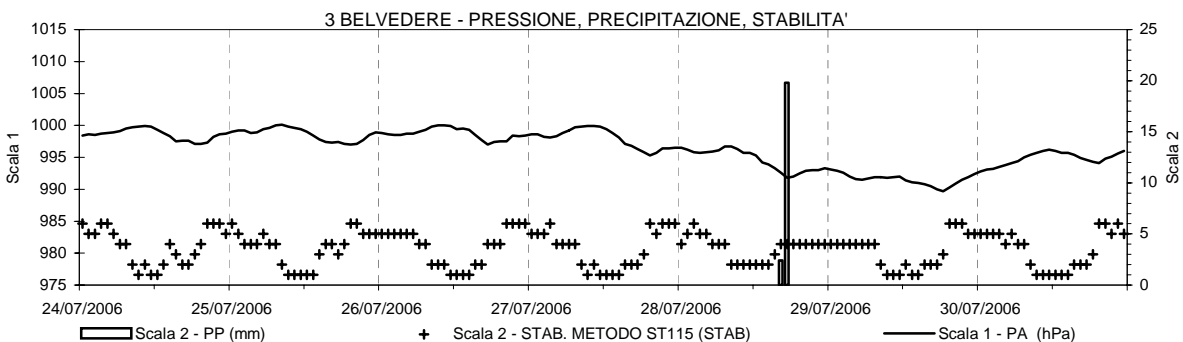
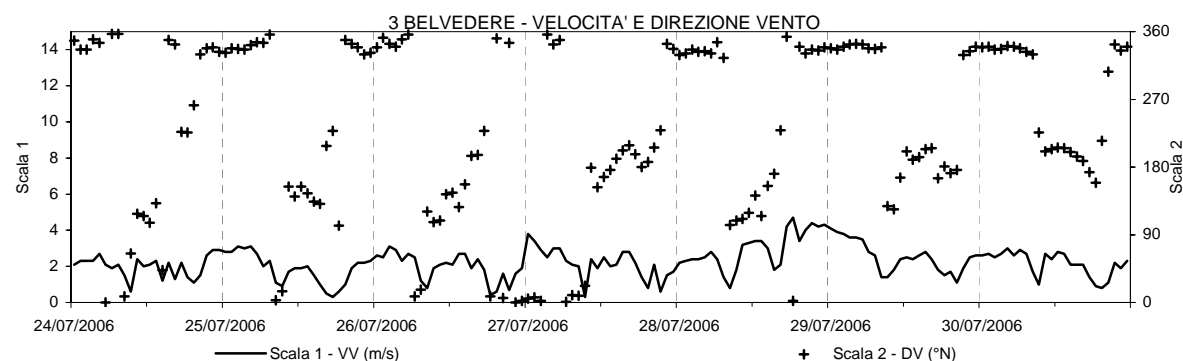
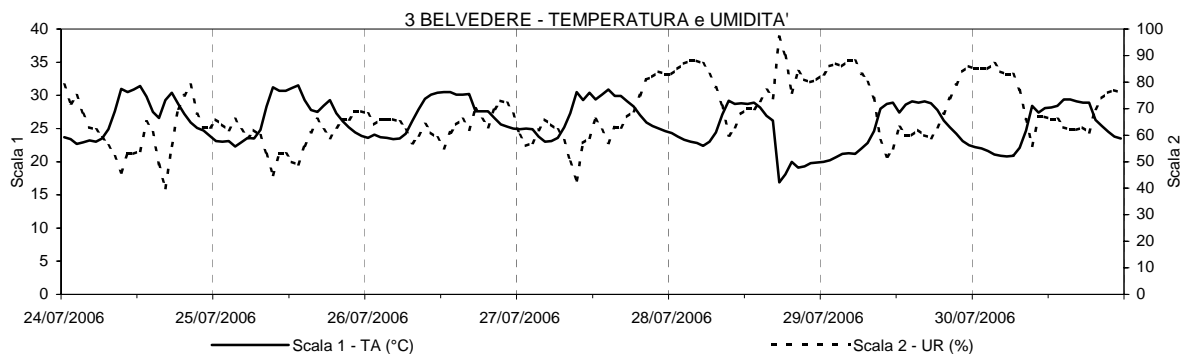


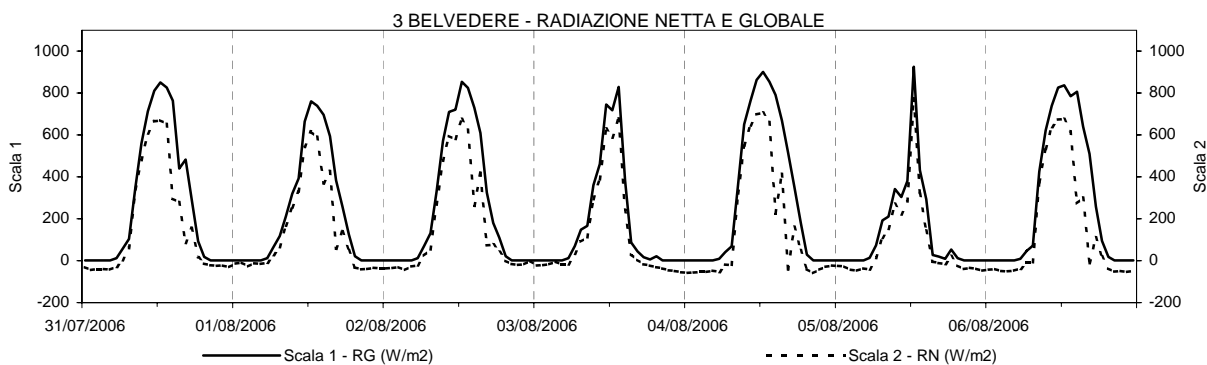
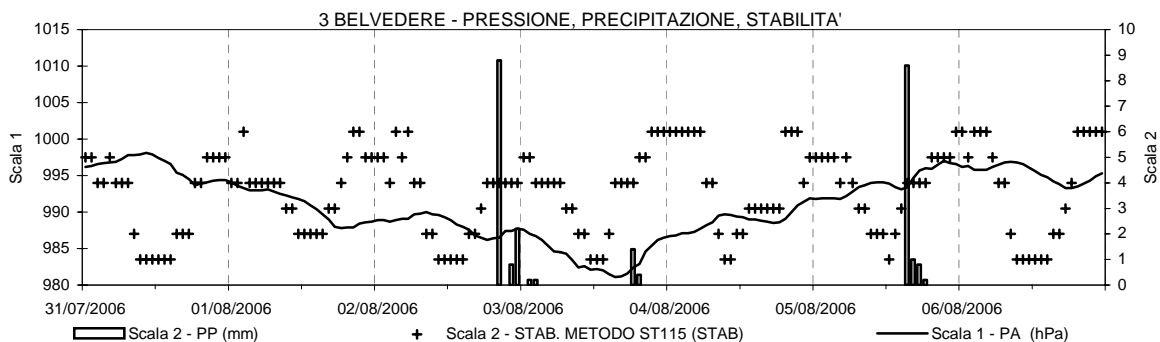
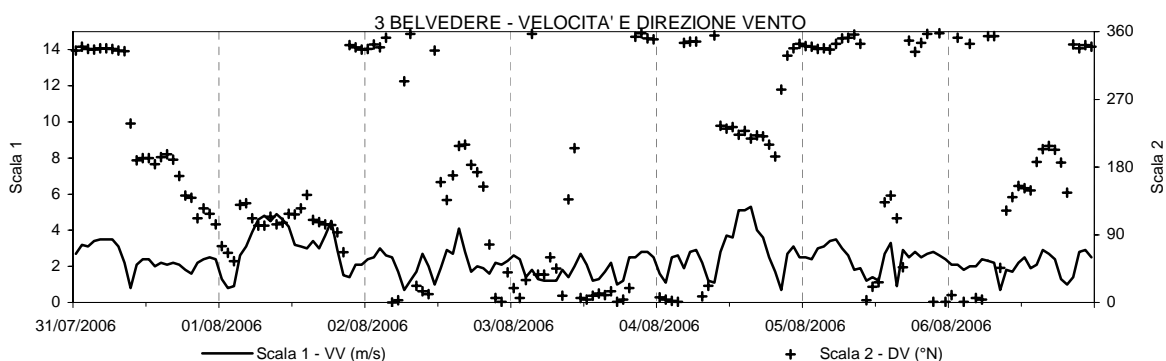
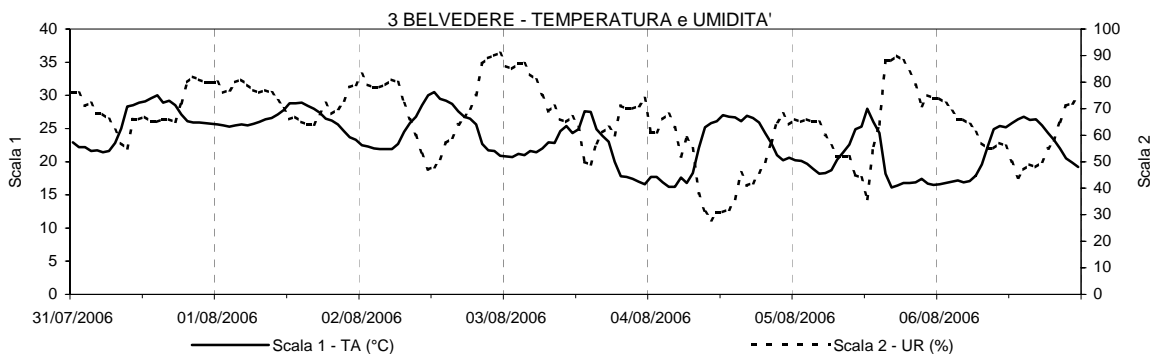


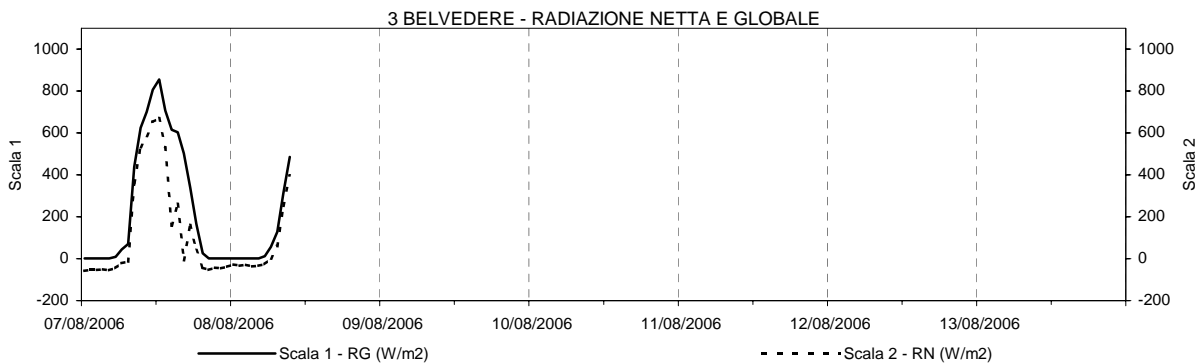
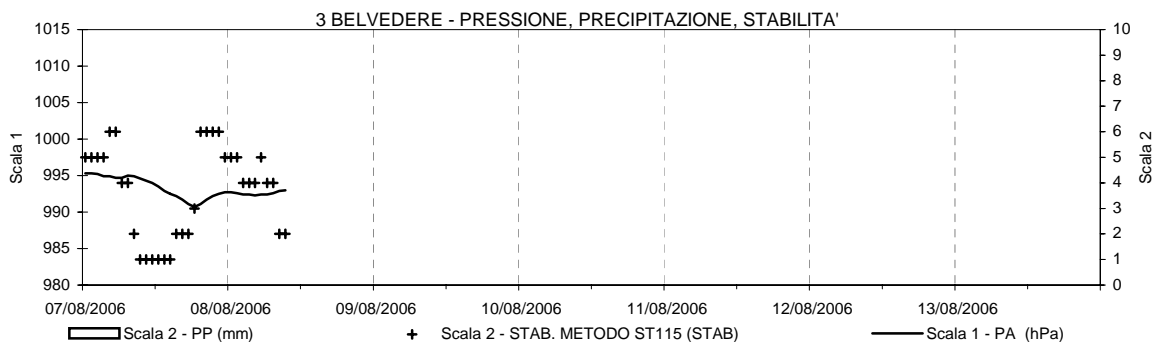
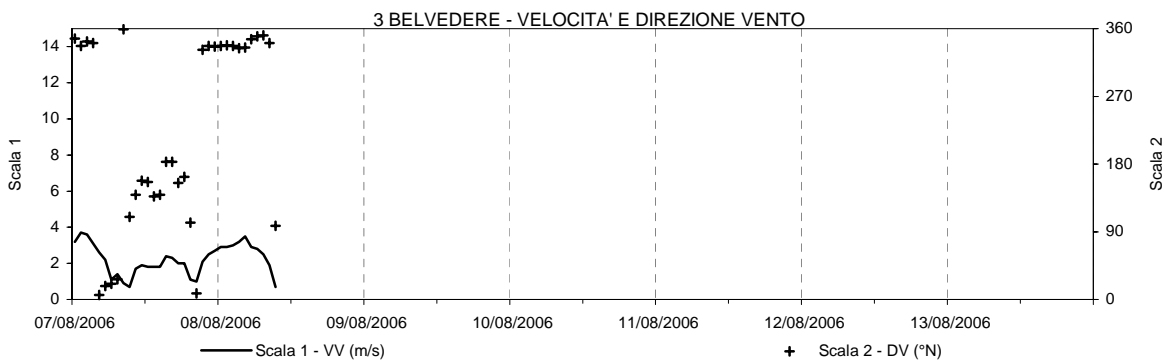
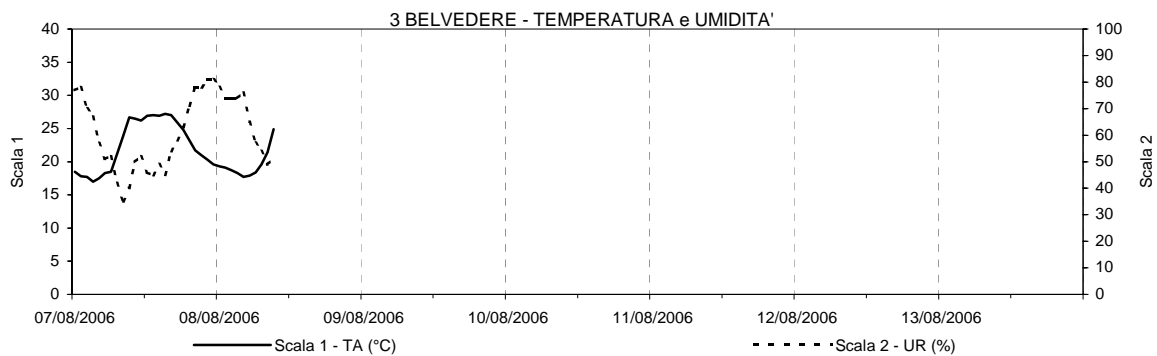












5 RAPPRESENTAZIONI GRAFICHE

Nel seguito, con la metodologia a cannocchiale, sono riportate le rose di vento calcolate sull'intero periodo. Sono rappresentate: la rosa complessiva, le rose diurna e notturna, le rose per categoria di stabilità.

