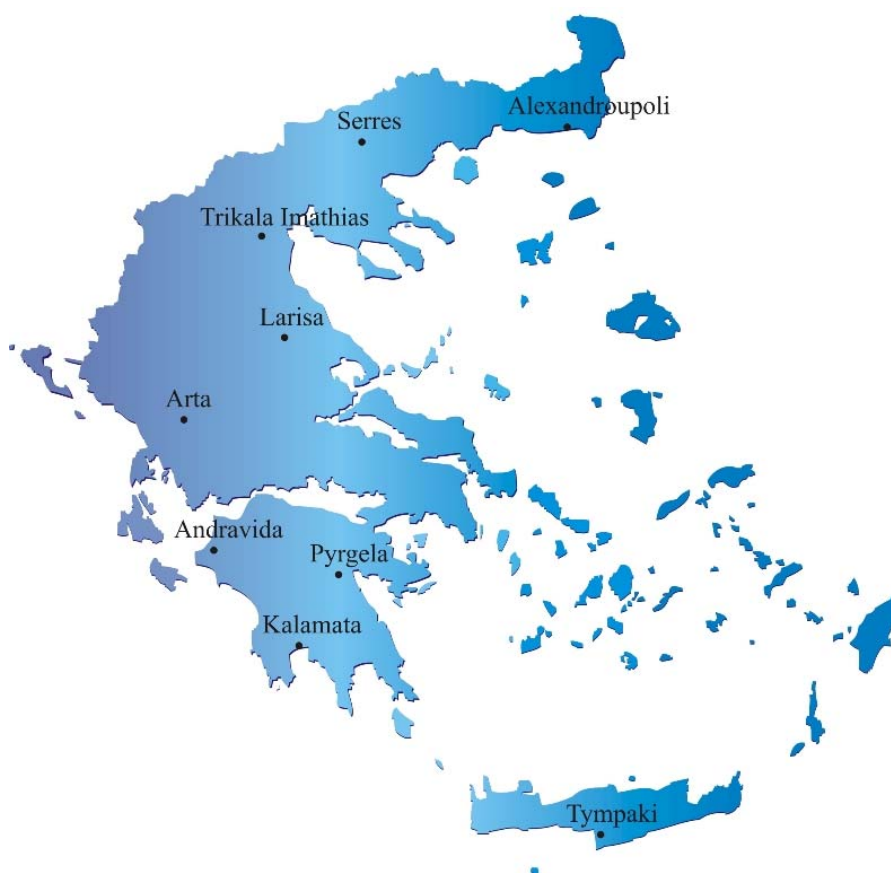




AGROMETEOROLOGICAL BULLETIN

January 2010
3rd 10-day period

- Temperature
- Relative Humidity
- Soil Temperature
- Sunshine Duration
- Precipitation
- Evaporation
- Growing Degrees
- Reference Evapotranspiration
- Accumulated Rainfall from the beginning of wet period
- Accumulated Reference Evapotranspiration
- Number of dry days



Hellenic National Meteorological Service
Division of Climatology-Applications
El. Venizelou Street 14, 16777
Helliniko, Athens

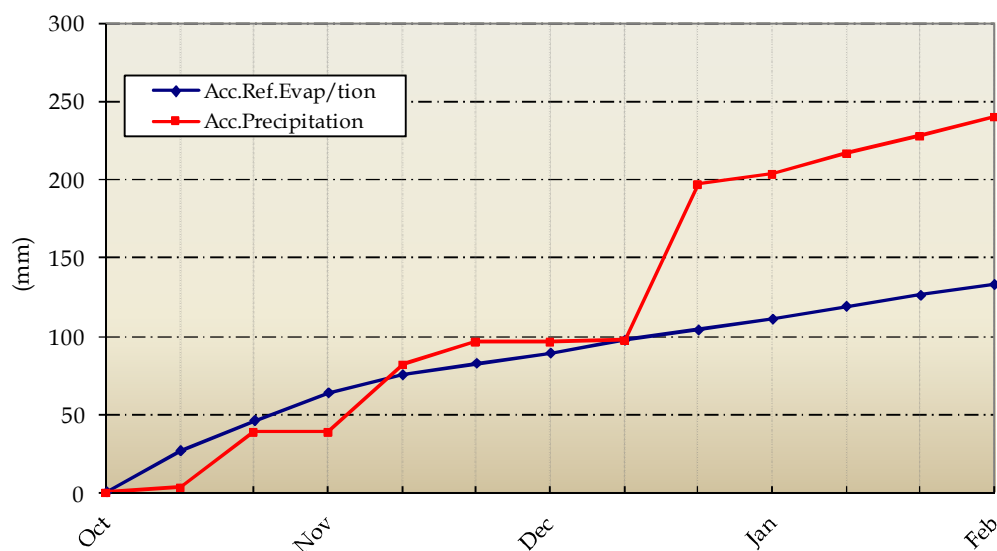
Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
www.meteo.gov.gr
www.meteohellas.gr

Alexandroupoli

3rd 10-day period (21-31/01/2010)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	2.6	1.0	0.6	-1.8	-2.6	1.0	2.4	2.8	4.6	9.0	13.4	3.0	13.5	8.8
	Min	-2.2	-1.8	-5.6	-7.4	-8.0	-12.6	-8.8	-5.4	1.8	2.4	4.0	-4.0	7.9	1.4
Relative Humidity	Max	88	89	96	90	80	83	95	97	97	97	97	92	94	-
	Min	67	56	58	44	18	43	56	66	82	81	84	60	67	-
Soil Temperature at 10 cm	06 UTC	-	3.4	2.6	1.4	0.8	0.2	-0.2	0.2	1.2	3.2	5.2	1.8	9.3	4.6
	12 UTC	3.8	3.6	3.0	1.6	0.6	0.0	0.2	0.2	2.8	4.5	7.0	2.5	10.3	5.8
Sunshine Duration		0.0	0.0	0.9	1.2	8.9	8.6	0.0	0.1	0.0	2.2	1.6	2.1	3.7	3.3
Precipitation			0.0	0.0				0.0	0.0	0.4	0.4	11.8	12.6	44.0	16.6
Evaporation		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.0	10.0
Growing Degrees	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	3.7	4.4	63.7	16.7
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.3	2.2

3rd 10-day period (21-31/01/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.9	10.1	10.8
Precipitation - Reference Evapotranspiration	5.7	33.9	5.8
Number of Rainy Days	3.0	6.0	2.7
Number of Dry Days	8.0	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

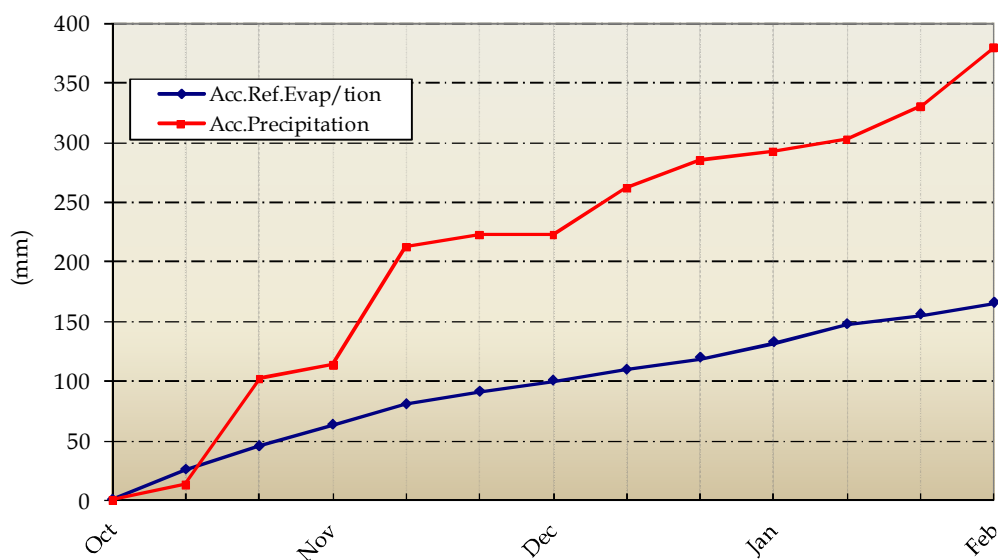


Andravida

3rd 10-day period (21-31/01/2010)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	10.6	9.6	9.4	10.2	10.4	10.0	7.2	14.8	14.8	15.6	14.6	11.6	15.5	14.0
	Min	3.8	6.6	4.6	-1.0	5.2	4.2	1.4	6.4	10.0	8.8	9.0	5.4	8.6	5.3
Relative Humidity	Max	97	97	97	96	94	94	97	97	97	95	95	96	95	-
	Min	54	67	65	48	62	58	57	80	59	62	52	60	65	-
Soil Temperature at 10 cm	06 UTC	9.4	9.4	8.8	7.4	8.6	9.2	8.4	8.4	10.2	11.0	11.4	9.3	11.3	8.6
	12 UTC	10.0	9.8	9.2	8.6	9.6	10.2	8.2	9.8	11.4	12.2	12.0	10.1	12.1	10.2
Sunshine Duration		0.0	0.0	0.0	3.2	0.0	2.0	0.0	0.8	5.4	5.0	5.9	2.0	3.2	4.8
Precipitation		8.1	8.8	4.4				7.0	7.8	3.7	1.7	7.2	48.7	98.3	33.1
Evaporation		0.1	0.9	0.7	2.1	0.2	0.3	2.1	0.4	0.9	0.7	0.2	8.6	22.4	18.6
Growing Degrees	5	2.2	3.1	2.0	0.0	2.8	2.1	0.0	5.6	7.4	7.2	6.8	39.2	77.1	51.2
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.4	2.2	1.8	7.0	24.3	9.9

3rd 10-day period (21-31/01/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.7	12.1	11.9
Precipitation - Reference Evapotranspiration	39.0	86.2	21.2
Number of Rainy Days	8.0	7.0	4.6
Number of Dry Days	1.0	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

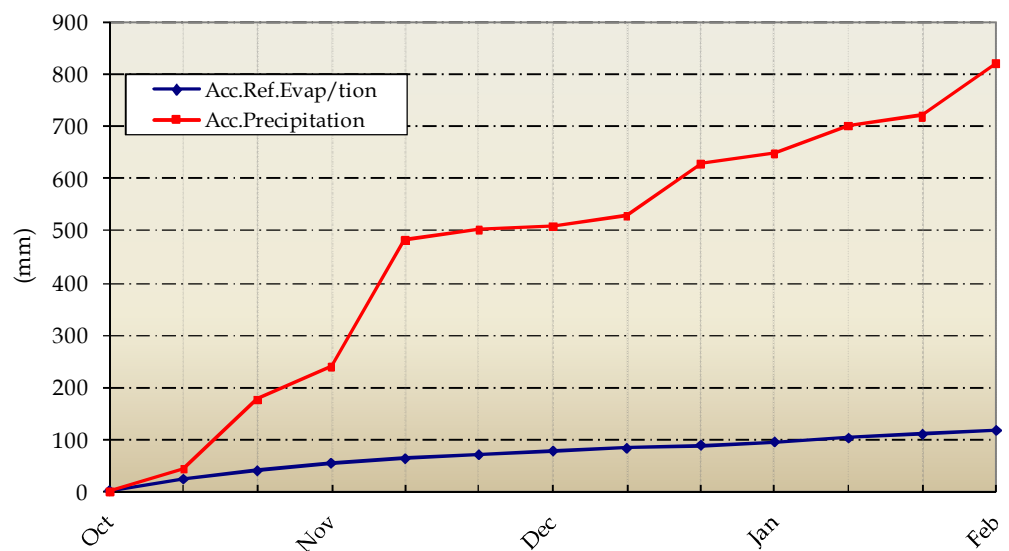


Arta

3rd 10-day period (21-31/01/2010)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	11.2	11.2	12.4	11.0	11.8	8.6	6.8	10.0	12.6	11.4	14.6	11.1	14.5	14.0
	Min	-1.0	7.0	1.6	-1.6	1.4	5.4	4.0	4.6	7.0	6.4	9.2	4.0	7.1	3.5
Relative Humidity	Max	99	96	97	97	81	69	98	98	97	100	95	93	94	-
	Min	45	40	48	33	41	49	62	88	90	81	64	58	59	-
Soil Temperature at 10 cm	06 UTC	6.4	7.8	7.2	6.4	6.6	7.4	7.2	7.0	8.0	8.6	9.4	7.5	10.5	6.8
	12 UTC	6.8	8.2	7.6	7.0	7.2	7.8	7.4	7.6	8.6	9.2	10.0	7.9	10.8	8.3
Sunshine Duration		1.8	0.0	3.2	6.9	1.3	0.0	0.0	0.0	0.5	0.0	5.0	1.7	2.5	4.6
Precipitation			0.5	9.8				18.6	7.8	26.0	19.8	18.7	101.2	163.0	38.8
Evaporation		0.6	1.5	0.0	0.0	2.8	0.3	0.5	0.6	0.0	0.8	3.4	10.5	-	-
Growing Degrees	5	0.1	4.1	2.0	0.0	1.6	2.0	0.4	2.3	4.8	3.9	6.9	28.1	63.8	42.3
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	1.9	15.2	6.6

3rd 10-day period (21-31/01/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.5	8.0	9.6
Precipitation - Reference Evapotranspiration	93.7	155.0	29.2
Number of Rainy Days	7.0	11.0	4.0
Number of Dry Days	3.0	5.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

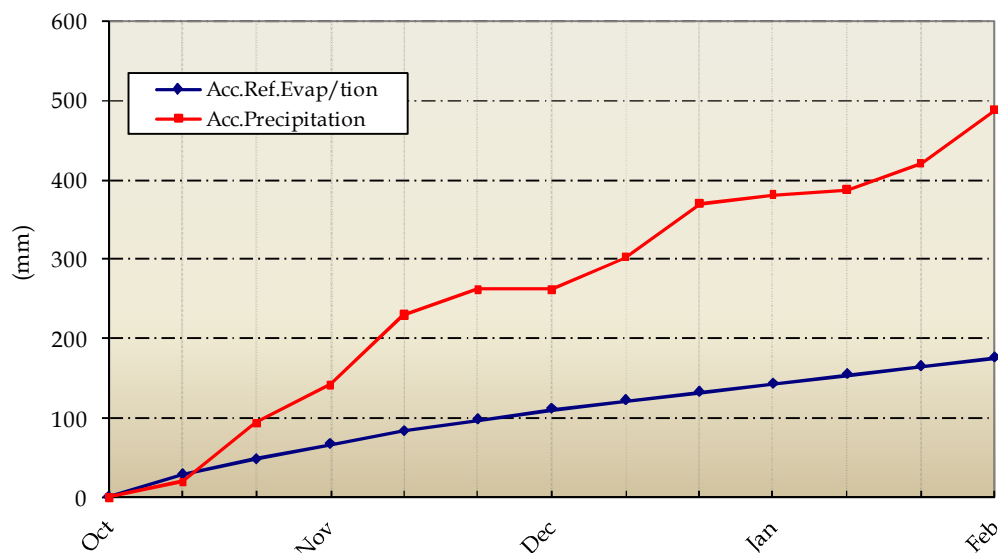


Kalamata

3rd 10-day period (21-31/01/2010)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	10.6	12.6	9.2	12.6	10.4	12.0	9.0	14.0	16.4	14.6	14.4	12.3	16.0	14.8
	Min	1.8	5.4	1.4	1.8	5.2	3.6	4.0	6.6	9.0	9.2	9.2	5.2	9.1	5.3
Relative Humidity	Max	94	94	97	88	81	82	88	100	97	95	95	92	96	-
	Min	72	70	76	40	56	48	65	77	60	74	64	64	67	-
Soil Temperature at 10 cm	06 UTC	9.6	9.6	9.4	9.2	9.6	9.4	9.0	9.4	10.6	11.0	11.4	9.8	11.7	9.0
	12 UTC	10.2	10.4	9.6	10.2	10.0	10.0	9.0	10.0	11.0	11.4	11.8	10.3	12.1	10.3
Sunshine Duration		0.5	1.1	1.2	6.8	0.0	7.7	0.0	0.2	3.8	2.8	3.9	2.5	3.4	4.4
Precipitation		8.8	16.3	2.2	1.0			0.0	5.1	7.9	7.2	19.9	68.4	131.8	36.5
Evaporation		0.5	1.1	2.5	1.6	1.7	3.5	0.8	0.4	3.6	4.0	2.2	21.9	26.0	21.4
Growing Degrees	5	1.2	4.0	0.3	2.2	2.8	2.8	1.5	5.3	7.7	6.9	6.8	41.5	83.1	55.6
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.7	1.9	1.8	6.7	30.8	9.3

3rd 10-day period (21-31/01/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	11.2	11.9	13.4
Precipitation - Reference Evapotranspiration	57.2	119.9	23.1
Number of Rainy Days	8.0	10.0	4.7
Number of Dry Days	0.0	1.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

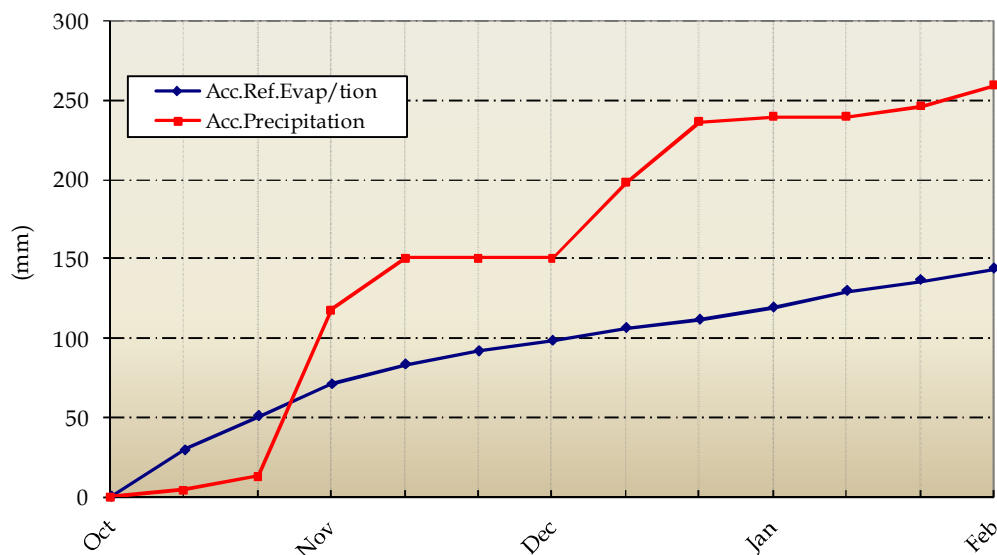


Larisa

3rd 10-day period (21-31/01/2010)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	9.4	6.8	4.8	5.4	3.6	2.8	2.0	5.2	7.6	11.0	13.2	6.5	14.0	10.7
	Min	-3.0	4.2	0.8	0.4	1.0	0.8	1.6	1.6	0.4	5.8	5.0	1.7	5.2	1.2
Relative Humidity	Max	97	97	97	81	92	96	96	96	95	97	100	95	96	-
	Min	59	65	56	65	55	89	89	80	94	75	54	71	65	-
Soil Temperature at 10 cm	06 UTC	6.0	7.0	6.4	6.2	6.0	5.8	5.8	5.4	3.4	7.2	7.6	6.1	8.7	5.5
	12 UTC	6.6	7.0	6.4	6.6	6.4	6.0	6.0	6.2	6.6	8.0	8.6	6.8	9.1	6.2
Sunshine Duration		5.3	0.0	1.9	4.7	0.1	0.0	0.0	0.0	0.3	1.0	7.1	1.9	3.3	3.5
Precipitation			6.4	1.6			0.2	3.8	0.0	0.1	0.1	1.3	13.5	44.1	10.7
Evaporation		0.0	0.7	2.1	0.2	2.2	0.3	1.1	0.0	0.4	0.3	0.9	8.2	25.1	7.0
Growing Degrees	5	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	4.1	8.0	50.6	18.5
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	1.5

3rd 10-day period (21-31/01/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.2	10.4	8.6
Precipitation - Reference Evapotranspiration	6.3	33.7	2.1
Number of Rainy Days	7.0	7.0	3.0
Number of Dry Days	3.0	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

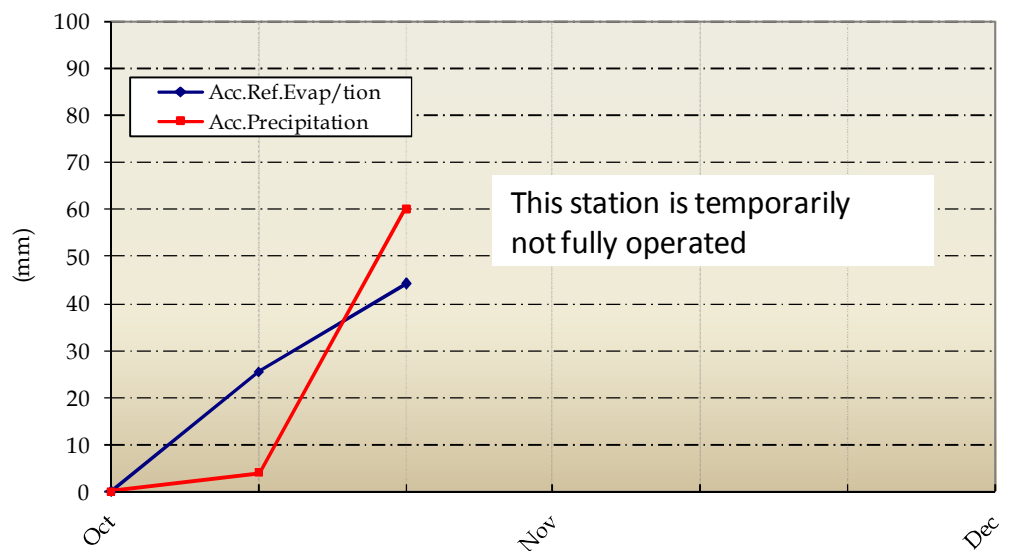


Pyrgela

3rd 10-day period (21-31/01/2010)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	-	-	-	-	-	-	-	-	-	-	-	16.8	14.0
	Min	-1.8	4.2	1.0	-	4.4	3.0	3.8	3.4	-	-	-	2.6	7.0	3.0
Relative Humidity	Max	92	85	-	92	90	93	81	-	-	-	-	89	92	-
	Min	52	62	-	37	55	63	73	-	-	-	-	57	64	-
Soil Temperature at 10 cm	06 UTC	5.8	7.4	7.0	-	7.4	7.6	6.4	6.4	-	-	-	6.9	10.3	6.7
	12 UTC	8.2	9.0	9.0	-	7.4	7.6	6.8	8.0	-	-	-	8.0	11.9	9.8
Sunshine Duration		3.0	0.0	-	5.5	0.0	0.0	0.0	-	-	-	-	1.4	3.5	4.2
Precipitation		6.2	17.6	0.7				4.9	0.7				-	38.3	25.2
Evaporation		0.8	0.0	-	0.6	1.0	1.6	0.0	-	-	-	-	-	11.5	13.2
Growing Degrees	5	-	-	-	-	-	-	-	-	-	-	-	-	75.7	39.4
	10	-	-	-	-	-	-	-	-	-	-	-	-	23.4	5.4

3rd 10-day period (21-31/01/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	10.1	10.3
Precipitation - Reference Evapotranspiration	-	28.2	14.9
Number of Rainy Days	-	7.0	3.7
Number of Dry Days	-	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

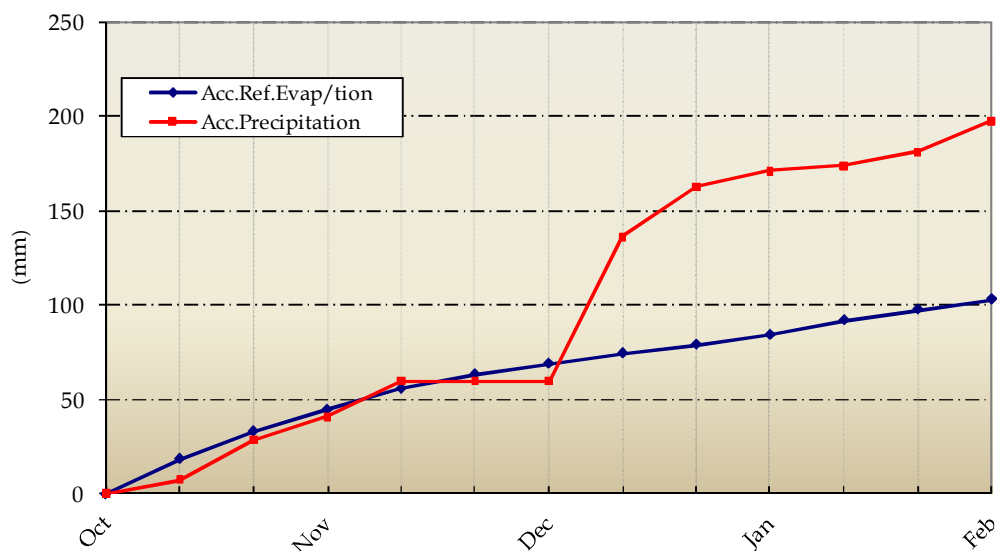


3rd 10-day period (21-31/01/2010)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	7.4	7.6	4.2	2.6	3.6	0.0	1.6	0.4	4.2	6.2	11.0	4.4	13.2	8.6
	Min	-1.8	0.4	-1.8	-4.4	-5.0	-4.2	-4.4	-3.0	-1.8	0.0	2.6	-2.1	4.9	0.4
Relative Humidity	Max	92	85	96	90	77	71	84	-	96	97	94	88	91	-
	Min	62	48	75	64	52	46	51	-	84	85	78	64	68	-
Soil Temperature at 10 cm	06 UTC	4.8	4.8	5.2	4.0	3.2	2.8	2.6	3.0	-	3.4	5.2	3.9	8.3	3.9
	12 UTC	6.0	5.4	5.2	3.6	3.2	2.8	2.8	3.2	4.0	3.8	6.4	4.2	8.5	4.6
Sunshine Duration		1.4	0.0	2.3	1.1	4.6	0.0	0.0	0.0	0.1	0.0	1.1	1.0	2.5	3.2
Precipitation				1.1					8.0	3.9	1.9	1.4	16.3	60.6	11.3
Evaporation		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	-	2.9
Growing Degrees	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	1.8	44.6	9.9
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.6

Series

3rd 10-day period (21-31/01/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	5.3	8.4	6.3
Precipitation - Reference Evapotranspiration	11.0	52.2	5.0
Number of Rainy Days	5.0	9.0	3.0
Number of Dry Days	2.0	5.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

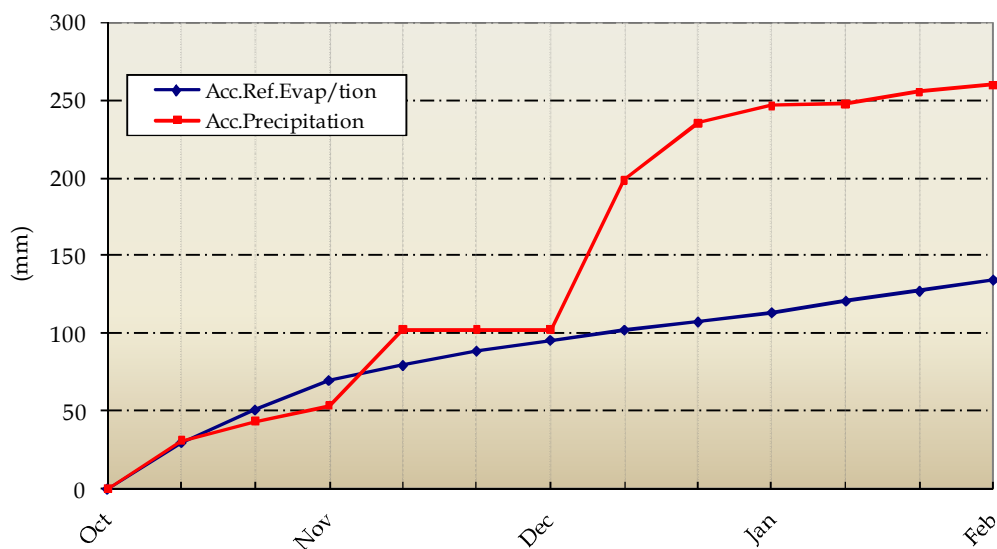


Trikala Imathias

3rd 10-day period (21-31/01/2010)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	10.0	6.0	3.6	2.2	3.2	1.6	1.2	2.4	7.2	10.4	16.6	5.9	13.5	9.2
	Min	0.4	3.4	-1.0	-3.0	-4.0	-1.6	-0.4	-0.4	1.4	3.0	5.8	0.3	6.2	0.9
Relative Humidity	Max	86	87	81	84	99	99	96	99	99	97	94	93	91	-
	Min	38	66	51	54	60	86	92	92	74	77	35	66	68	-
Soil Temperature at 10 cm	06 UTC	6.0	5.8	5.6	4.2	3.6	4.6	4.2	4.0	4.6	5.2	7.0	5.0	8.5	5.3
	12 UTC	7.0	6.4	5.8	5.0	3.2	4.6	4.2	4.0	5.2	7.0	7.4	5.4	9.1	5.5
Sunshine Duration		6.9	0.0	1.0	4.6	0.4	0.0	0.0	0.0	1.6	2.3	4.4	1.9	3.4	3.7
Precipitation								0.8	2.3	1.5			4.6	66.7	16.5
Evaporation		0.3	0.8	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.7	1.5	5.3	-	6.8
Growing Degrees	5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	6.2	8.1	-	13.5
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2	-	0.5

3rd 10-day period (21-31/01/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.2	8.8	8.6
Precipitation - Reference Evapotranspiration	-2.6	57.9	7.9
Number of Rainy Days	3.0	5.0	3.3
Number of Dry Days	8.0	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

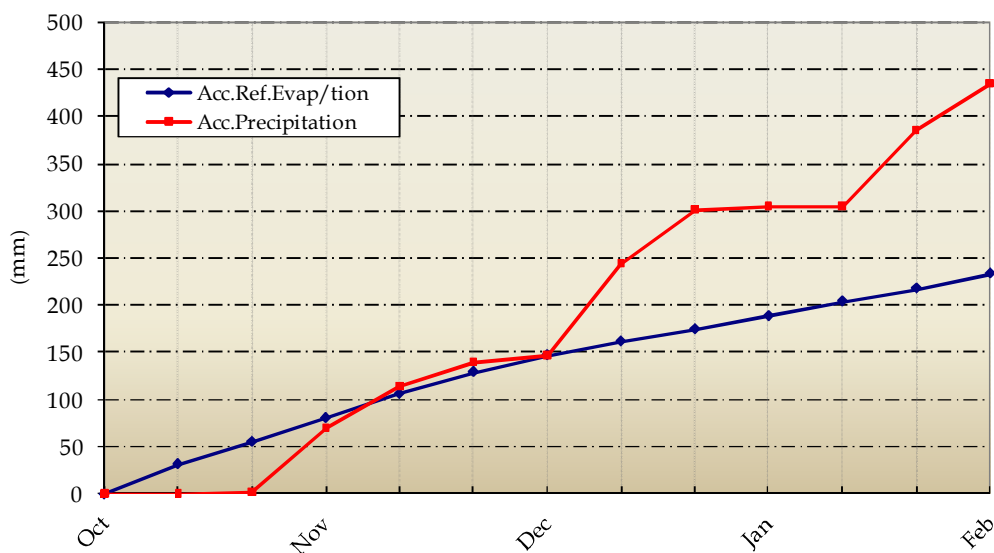


Tympaki

3rd 10-day period (21-31/01/2010)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.4	14.6	12.8	12.4	12.2	11.0	13.6	17.6	17.2	17.2	16.6	14.5	17.5	15.7
	Min	3.6	10.2	8.4	6.0	5.0	3.8	3.0	10.0	11.4	7.6	11.0	7.3	10.6	7.2
Relative Humidity	Max	100	99	97	99	82	79	93	99	99	98	99	95	95	-
	Min	39	67	57	37	37	45	46	66	70	56	59	53	56	-
Soil Temperature at 10 cm	06 UTC	9.4	12.6	11.0	10.4	9.0	7.6	7.0	11.0	12.8	11.2	13.0	10.5	12.9	10.5
	12 UTC	12.0	13.4	12.2	12.2	11.2	10.6	10.6	14.2	15.0	14.4	14.2	12.7	14.7	12.3
Sunshine Duration		2.5	1.3	0.6	8.4	5.0	8.3	4.3	2.8	3.0	6.9	2.9	4.2	2.7	4.9
Precipitation		1.9	37.5		4.0							5.7	49.1	66.7	32.4
Evaporation		5.4	3.1	0.9	4.1	2.3	2.9	1.0	2.5	1.7	3.5	2.8	30.2	29.5	25.8
Growing Degrees	5	4.0	7.4	5.6	4.2	3.6	2.4	3.3	8.8	9.3	7.4	8.8	64.8	99.3	70.7
	10	0.0	2.4	0.6	0.0	0.0	0.0	0.0	3.8	4.3	2.4	3.8	17.3	44.3	18.8

3rd 10-day period (21-31/01/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	15.8	16.9	16.3
Precipitation - Reference Evapotranspiration	33.3	49.8	16.1
Number of Rainy Days	4.0	8.0	3.8
Number of Dry Days	0.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration





◆ **List of Symbols and Abbreviations**

Reference Evapotranspiration ETo (mm):

Calculated by the FAO Penman-Montieth equation

$$ET_0 = \frac{0.408 * \Delta * (R_n - G) + \gamma * \frac{900}{T + 273} * u_2 * (e_s - e_a)}{\Delta + \gamma * (1 + 0.34 * u_2)}$$

using 10-day step.

R_n is estimated from sunshine measurements and G assumed to be zero.

Growing Degrees: Degrees with mean temperature exceeding the base of 5 or 10 °C.

Number of Rainy Days: Number of days with precipitation of at least 0.1 mm.

Number of Dry Days: Number of dry days recorded since the last rainy day.

Measurements Units

- ◆ Temperature : °C
- ◆ Relative Humidity : %
- ◆ Soil Temperature : °C
- ◆ Sunshine Duration : Hours
- ◆ Precipitation : mm
- ◆ Evaporation (Pan) : mm
- ◆ Growing Degrees : °C

UTC (Universal Time coordinates) in Greece

- ◆ Winter : Time(UTC) = Local time - 2
- ◆ Summer : Time(UTC) = Local time - 3

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