



AGROMETEOROLOGICAL BULLETIN

*January 2014
2nd 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
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Helliniko, Athens

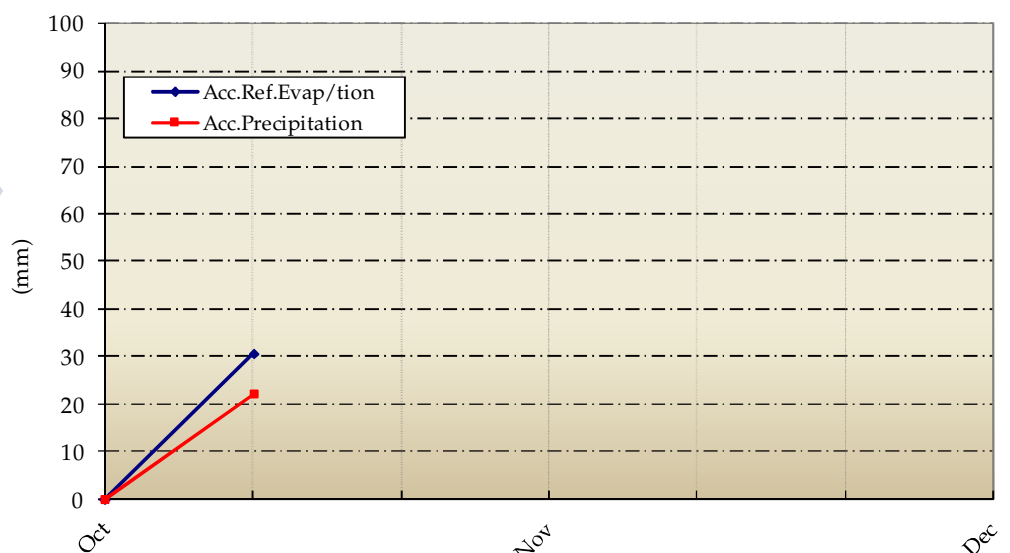
Web addresses of HNMS
www.emy.gr
www.emy.gov.gr
www.meteo.gov.gr
www.meteohellas.gr

2nd 10-day period (11-20/01/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	-	15.0	13.0	16.0	14.4	15.7	-	-	16.0	15.0		13.5
	Min	-	-	7.0	7.0	5.0	10.0	5.6	-	-	11.0	7.6	7.3	2.5
Relative Humidity	Max	-	91	91	85	88	90	85	-	92	89	89	93	-
	Min	-	48	69	72	71	75	76	-	67	78	70	56	-
Soil Temperature at 10 cm	06 UTC	-	-	7.0	7.0	4.0	11.0	10.0	-	-	12.0	8.5	8.9	6.8
	12 UTC	-	-	10.0	11.0	11.0	13.0	13.0	-	-	16.0	12.3	9.4	8.7
Sunshine Duration		-	3.8	0.0	0.8	0.0	1.4	-	-	6.2	5.8	2.6	3.7	4.2
Precipitation												-	100.3	31.5
Evaporation		-	0.7	0.4	3.4	26.2	1.0	-	-	0.6	10.0	-	-	12.8
Growing Degrees	5	-	-	6.0	5.0	5.5	7.2	5.7	-	-	8.5	-	-	31.3
	10	-	-	1.0	0.0	0.5	2.2	0.7	-	-	3.5	-	-	3.9

2nd 10-day period (11-20/01/2014)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	9.4
Precipitation - Reference Evapotranspiration	-	22.1
Number of Rainy Days	0.0	5.0
Number of Dry Days	49.0	10.0

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

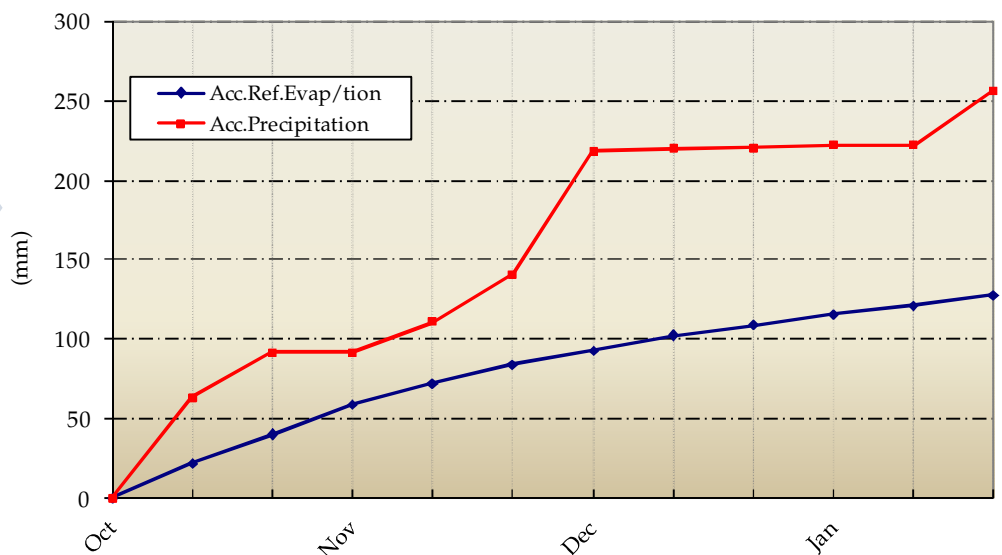
This station is not fully operated



2nd 10-day period (11-20/01/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.2	12.6	13.0	14.6	14.4	14.6	13.6	15.0	15.0	16.4	14.3	12.3	8.0
	Min	1.4	0.6	4.8	1.6	1.2	8.0	7.4	9.6	7.0	12.0	5.4	5.1	0.2
Relative Humidity	Max	93	100	97	100	95	100	100	97	94	93	97	94	-
	Min	50	76	59	54	75	76	82	80	67	79	70	64	-
Soil Temperature at 10 cm	06 UTC	6.2	5.8	6.2	6.2	6.4	10.4	9.8	10.0	9.4	11.8	8.2	6.7	4.2
	12 UTC	8.0	7.8	8.4	9.0	8.4	11.6	11.0	11.6	11.6	12.6	10.0	7.8	5.1
Sunshine Duration		7.5	4.4	7.1	6.9	0.9	1.0	2.6	0.0	6.5	1.6	3.8	3.7	3.1
Precipitation						0.1	33.6				0.3	34.0	37.5	11.4
Evaporation		1.1	0.2	0.1	1.4	0.1	1.0	0.1	0.1	2.8	0.1	7.0	-	6.6
Growing Degrees	5	2.8	1.6	3.9	3.1	2.8	6.3	5.5	7.3	6.0	9.2	48.5	37.7	9.4
	10	0.0	0.0	0.0	0.0	0.0	1.3	0.5	2.3	1.0	4.2	9.3	4.5	0.9

2nd 10-day period (11-20/01/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.0	9.0	8.8
Precipitation - Reference Evapotranspiration	27.0	28.5	2.6
Number of Rainy Days	3.0	5.0	2.2
Number of Dry Days	17.0	12.0	-

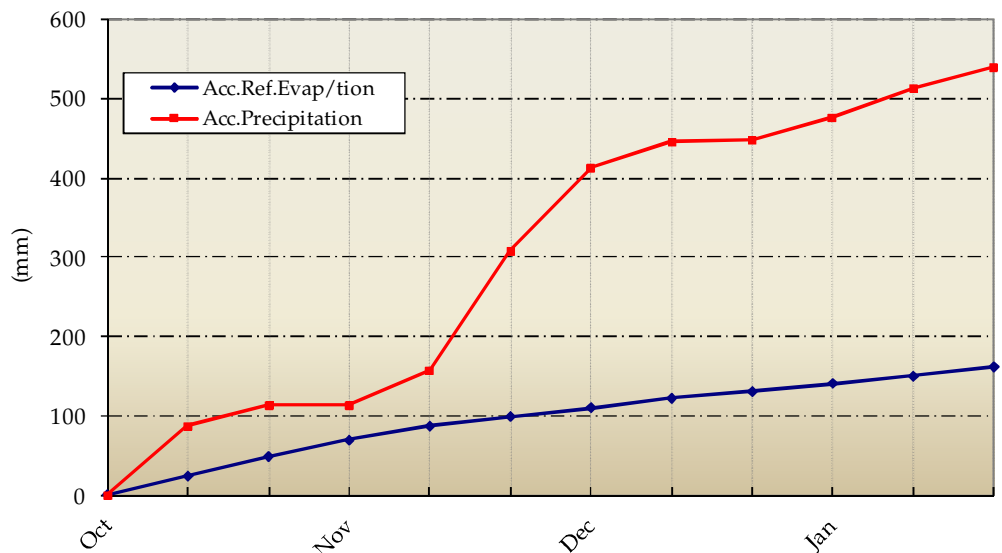
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/01/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.0	17.0	13.8	17.8	15.8	17.4	18.0	16.3	19.2	19.0	17.2	15.8	13.6
	Min	9.4	8.8	10.3	9.8	11.4	10.9	8.6	8.8	11.5	14.6	10.4	8.3	4.8
Relative Humidity	Max	86	89	87	91	92	92	90	89	85	80	88	86	-
	Min	54	60	78	54	63	61	55	63	51	67	61	56	-
Soil Temperature at 10 cm	06 UTC	11.4	11.2	11.8	11.4	12.0	12.0	11.6	11.2	12.0	12.8	11.7	10.2	8.3
	12 UTC	12.7	13.2	13.4	12.9	13.0	13.6	13.8	12.6	14.0	14.6	13.4	11.6	9.8
Sunshine Duration		4.7	5.9	0.0	3.6	0.0	6.2	7.8	1.1	2.4	6.7	3.8	4.3	4.4
Precipitation					2.6	8.8	14.2					25.6	75.8	33.0
Evaporation		0.2	0.8	0.8	1.0	0.5	0.0	1.0	1.0	3.7	2.2	11.2	17.1	18.1
Growing Degrees	5	8.7	7.9	7.1	8.8	8.6	9.2	8.3	7.6	10.4	11.8	88.2	70.5	42.4
	10	3.7	2.9	2.1	3.8	3.6	4.2	3.3	2.6	5.4	6.8	38.2	20.5	7.2

2nd 10-day period (11-20/01/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	11.9	13.8	9.4
Precipitation - Reference Evapotranspiration	13.7	62.0	23.6
Number of Rainy Days	3.0	7.0	3.7
Number of Dry Days	7.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

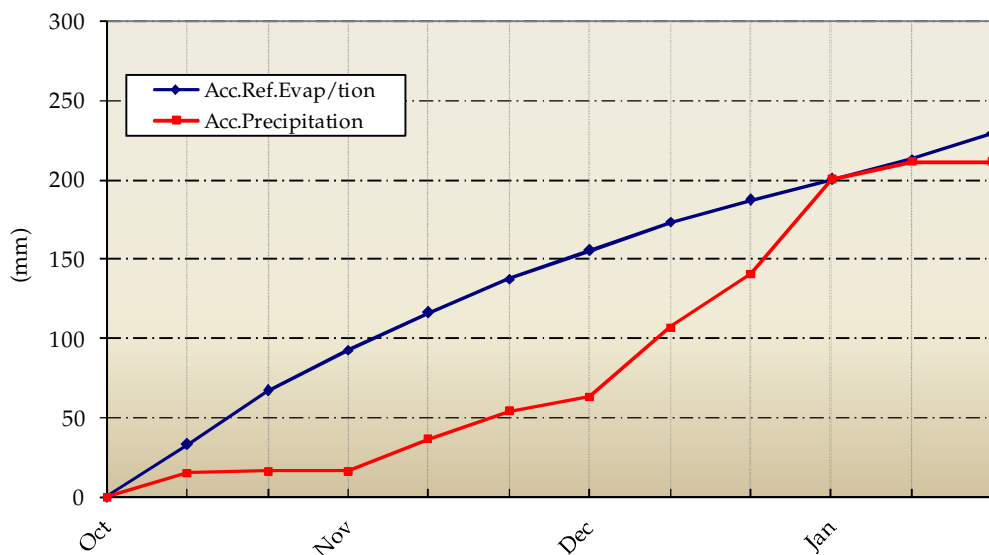


Iraklio

2nd 10-day period (11-20/01/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.0	18.4	18.5	18.2	18.4	17.0	18.0	19.5	19.5	20.8	18.6	18.0	14.7
	Min	10.0	11.0	11.0	10.8	11.0	13.2	9.8	10.5	13.5	14.0	11.5	10.8	9.1
Relative Humidity	Max	90	88	86	88	88	93	90	88	82	79	87	81	-
	Min	64	64	68	59	62	67	65	62	59	52	62	54	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		6.8	7.8	0.5	4.9	2.0	0.0	8.3	6.5	3.3	7.6	4.8	6.1	3.7
Precipitation						0.2	0.2					0.4	6.8	28.7
Evaporation		2.5	1.1	2.2	0.6	1.8	0.3	1.3	2.1	1.6	1.6	15.1	-	24.1
Growing Degrees	5	9.0	9.7	9.8	9.5	9.7	10.1	8.9	10.0	11.5	12.4	100.6	93.9	68.9
	10	4.0	4.7	4.8	4.5	4.7	5.1	3.9	5.0	6.5	7.4	50.6	43.9	21.0

2nd 10-day period (11-20/01/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	16.4	10.0	-
Precipitation - Reference Evapotranspiration	-16.0	-3.2	28.7
Number of Rainy Days	2.0	3.0	4.2
Number of Dry Days	7.0	7.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

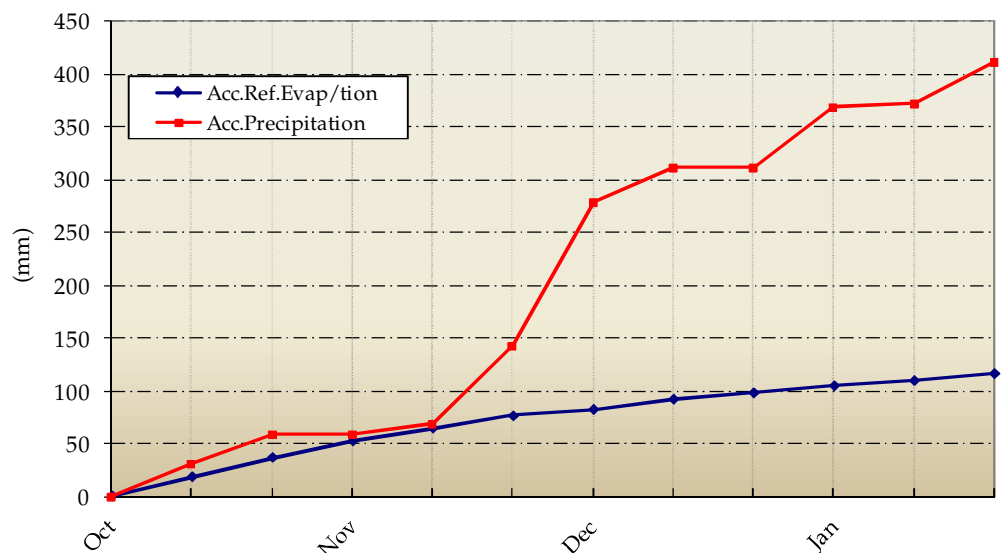


Ioannina

2nd 10-day period (11-20/01/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.1	11.4	10.2	13.1	10.7	10.8	9.9	9.9	12.8	15.4	11.7	9.4	8.7
	Min	4.8	-0.4	1.8	4.5	5.1	6.4	3.5	2.4	2.8	9.7	4.1	3.5	-0.4
Relative Humidity	Max	98	98	98	98	98	98	98	98	98	88	97	95	-
	Min	56	54	72	72	77	84	95	85	56	50	70	74	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	3.2
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	3.8
Sunshine Duration		5.4	2.2	0.0	0.4	0.0	1.4	0.5	0.2	2.1	4.6	1.7	0.5	3.0
Precipitation				0.0	0.0	23.7	14.6		0.0	0.1	0.2	38.6	190.4	26.9
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	4.4
Growing Degrees	5	4.0	0.5	1.0	3.8	2.9	3.6	1.7	1.2	2.8	7.6	29.0	18.9	9.3
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	2.6	0.0	0.3

2nd 10-day period (11-20/01/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.6	6.7	6.6
Precipitation - Reference Evapotranspiration	32.0	183.7	20.3
Number of Rainy Days	4.0	8.0	2.9
Number of Dry Days	8.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

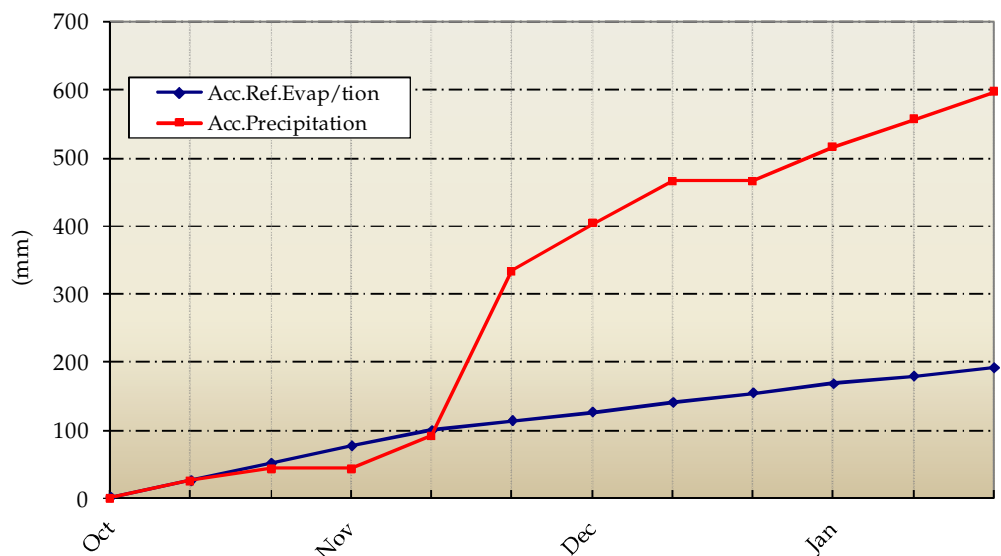


Kalamata

2nd 10-day period (11-20/01/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.9	18.0	16.0	16.9	16.8	15.1	19.1	17.9	18.4	19.2	17.6	16.1	14.6
	Min	7.6	6.1	7.7	9.1	8.6	8.9	5.9	4.5	9.0	14.6	8.2	7.0	4.9
Relative Humidity	Max	93	94	93	92	94	95	94	95	81	88	92	93	-
	Min	53	45	63	63	74	72	44	50	72	76	61	58	-
Soil Temperature at 10 cm	06 UTC	10.2	10.4	11.0	11.4	11.0	11.4	10.6	10.2	11.6	12.6	11.0	10.6	9.0
	12 UTC	10.6	11.2	11.4	11.6	11.6	11.8	11.0	10.8	12.0	13.0	11.5	11.1	10.1
Sunshine Duration		6.6	7.2	0.0	2.9	0.0	0.9	8.2	2.6	7.0	7.0	4.2	3.8	4.2
Precipitation					0.1	26.4	13.2					39.7	109.3	33.9
Evaporation		-	-	-	-	-	-	-	-	-	-	-	19.7	23.4
Growing Degrees	5	8.3	7.1	6.9	8.0	7.7	7.0	7.5	6.2	8.7	11.9	79.2	65.9	47.5
	10	3.3	2.1	1.9	3.0	2.7	2.0	2.5	1.2	3.7	6.9	29.2	16.2	8.1

2nd 10-day period (11-20/01/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	12.5	13.3	11.1
Precipitation - Reference Evapotranspiration	27.2	96.0	22.8
Number of Rainy Days	3.0	7.0	3.8
Number of Dry Days	6.0	12.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

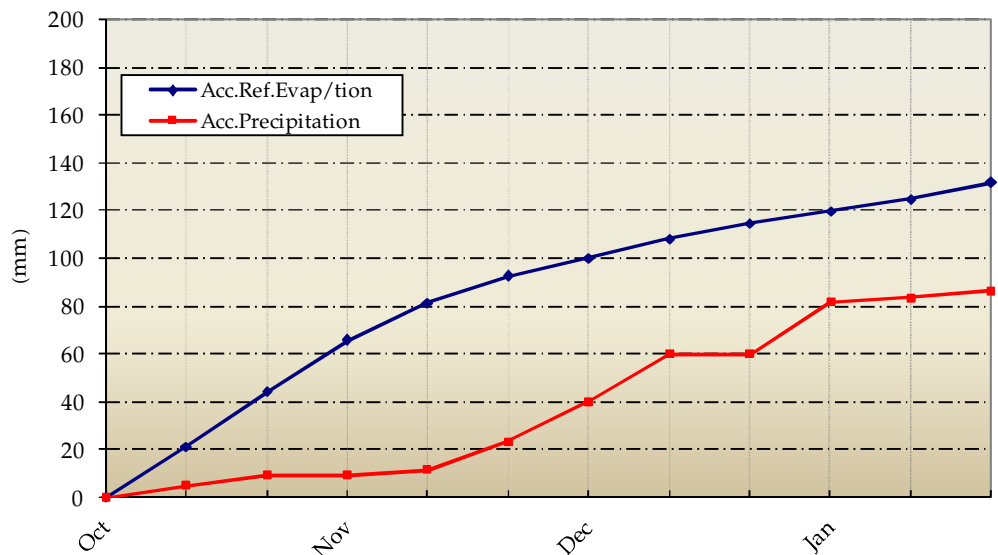


Larisa

2nd 10-day period (11-20/01/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	13.4	13.4	8.8	11.4	12.2	13.8	14.0	9.8	16.6	20.0	13.3	13.4	9.3
	Min	0.4	-0.4	0.6	3.3	6.8	7.0	5.4	2.4	2.0	4.6	3.2	1.9	0.0
Relative Humidity	Max	100	100	100	100	100	100	100	100	100	100	100	98	-
	Min	66	64	62	74	87	78	70	88	53	45	69	54	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	6.6	5.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	7.8	5.5
Sunshine Duration		3.3	4.9	0.0	0.0	0.0	1.9	4.2	0.0	4.6	6.7	2.6	5.0	3.6
Precipitation						2.4	0.7				0.1	3.2	15.2	8.6
Evaporation		1.7	2.3	0.8	0.0	0.1	0.2	0.2	0.0	0.0	3.0	8.3	11.9	5.9
Growing Degrees	5	1.9	1.5	0.0	2.4	4.5	5.4	4.7	1.1	4.3	7.3	33.1	26.8	9.7
	10	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	2.3	2.7	0.1	0.4

2nd 10-day period (11-20/01/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.6	8.5	6.4
Precipitation - Reference Evapotranspiration	-3.4	6.7	2.2
Number of Rainy Days	3.0	5.0	2.6
Number of Dry Days	7.0	11.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

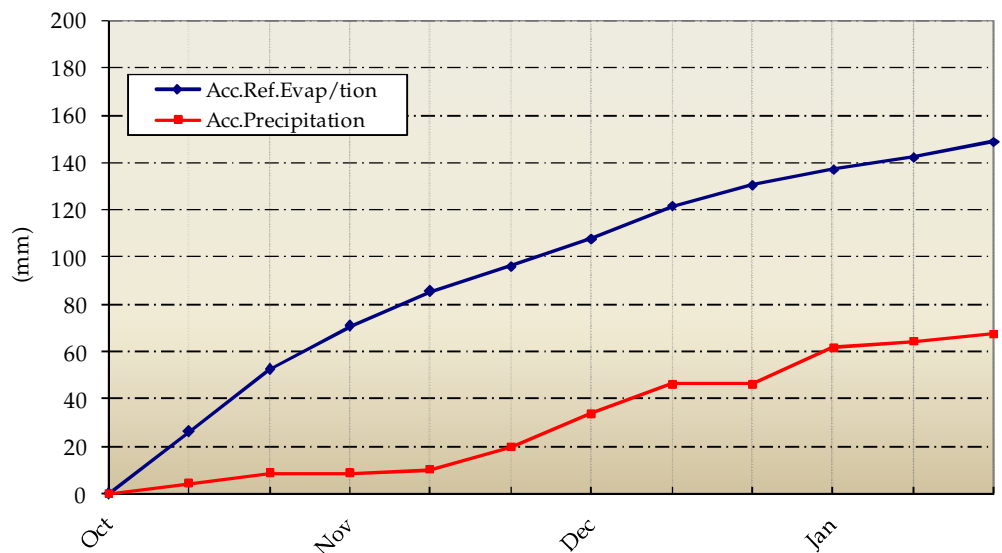


Mikra

2nd 10-day period (11-20/01/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	12.0	12.8	13.3	12.2	15.0	14.3	12.8	12.5	12.5	15.5	13.3	12.4	8.8
	Min	3.3	2.5	1.5	4.8	11.0	9.4	3.4	6.4	6.4	8.6	5.7	3.2	1.1
Relative Humidity	Max	95	94	94	92	93	94	93	92	94	94	94	88	-
	Min	68	63	66	69	67	76	78	78	77	72	71	51	-
Soil Temperature at 10 cm	06 UTC	8.0	7.2	6.8	7.7	10.2	10.8	8.4	9.8	9.6	10.6	8.9	6.6	4.3
	12 UTC	9.6	8.8	8.8	9.2	11.2	12.0	10.5	11.3	11.2	12.2	10.5	8.4	5.7
Sunshine Duration		5.5	5.0	6.9	2.5	0.0	1.9	7.2	0.9	2.4	5.6	3.8	4.1	3.6
Precipitation						2.2	0.9				0.4	3.5	7.7	6.6
Evaporation		0.2	1.8	2.0	1.0	0.3	0.6	0.1	0.3	2.3	0.1	8.7	13.5	10.5
Growing Degrees	5	2.7	2.7	2.4	3.5	8.0	6.9	3.1	4.5	4.5	7.1	45.1	30.5	11.4
	10	0.0	0.0	0.0	0.0	3.0	1.9	0.0	0.0	0.0	2.1	6.9	3.9	0.9

2nd 10-day period (11-20/01/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.5	9.9	8.8
Precipitation - Reference Evapotranspiration	-3.0	-2.2	-2.2
Number of Rainy Days	3.0	4.0	2.2
Number of Dry Days	12.0	12.0	-

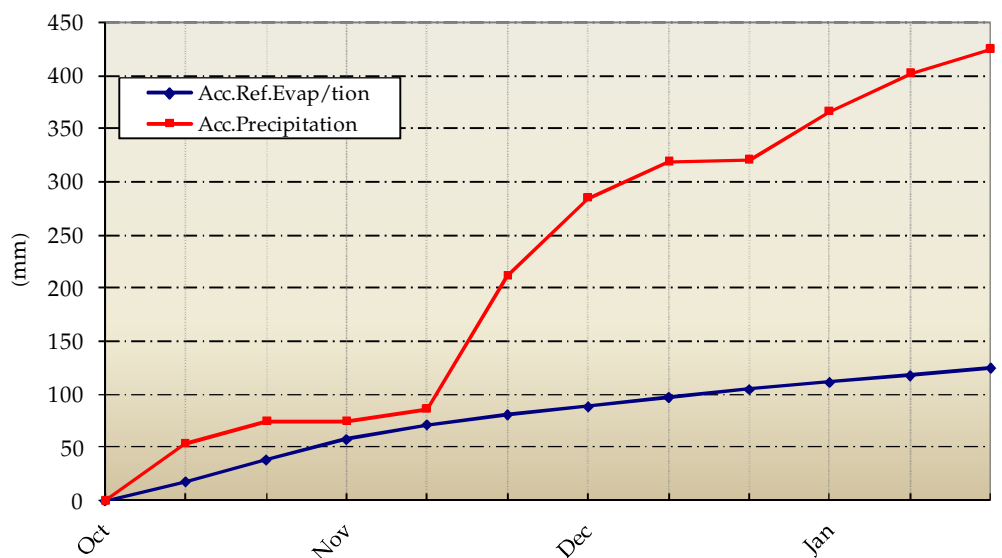
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/01/2014)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	14.9	15.2	9.7	10.4	9.4	13.9	15.9	12.7	15.2	16.5	13.4	11.5	9.4
	Min	-0.1	-0.2	3.1	5.3	2.4	6.9	-0.3	-0.1	5.8	7.4	3.0	2.6	0.1
Relative Humidity	Max	100	99	100	100	100	100	100	100	95	92	99	92	-
	Min	54	83	79	73	99	62	48	57	82	50	69	69	-
Soil Temperature at 10 cm	06 UTC	4.0	4.4	5.8	6.6	6.4	7.6	6.0	5.0	7.2	7.6	6.1	5.0	4.3
	12 UTC	7.0	-	7.0	8.0	7.2	9.0	8.8	7.4	-	10.6	8.1	7.2	5.0
Sunshine Duration		6.6	6.3	0.0	0.3	0.0	3.3	7.3	1.0	6.6	6.9	3.8	3.7	4.1
Precipitation				0.2		13.3	10.0					23.5	133.9	31.6
Evaporation		0.8	0.5	0.5	0.1	0.4	0.4	1.4	1.1	0.5	1.1	6.8	5.8	5.6
Growing Degrees	5	2.4	2.5	1.4	2.9	0.9	5.4	2.8	1.3	5.5	7.0	32.0	20.7	10.8
	10	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.5	2.0	2.9	0.0	0.5

2nd 10-day period (11-20/01/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.2	7.6	8.5
Precipitation - Reference Evapotranspiration	16.3	126.3	23.1
Number of Rainy Days	3.0	6.0	3.7
Number of Dry Days	5.0	10.0	-

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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