



AGROMETEOROLOGICAL BULLETIN

January 2013
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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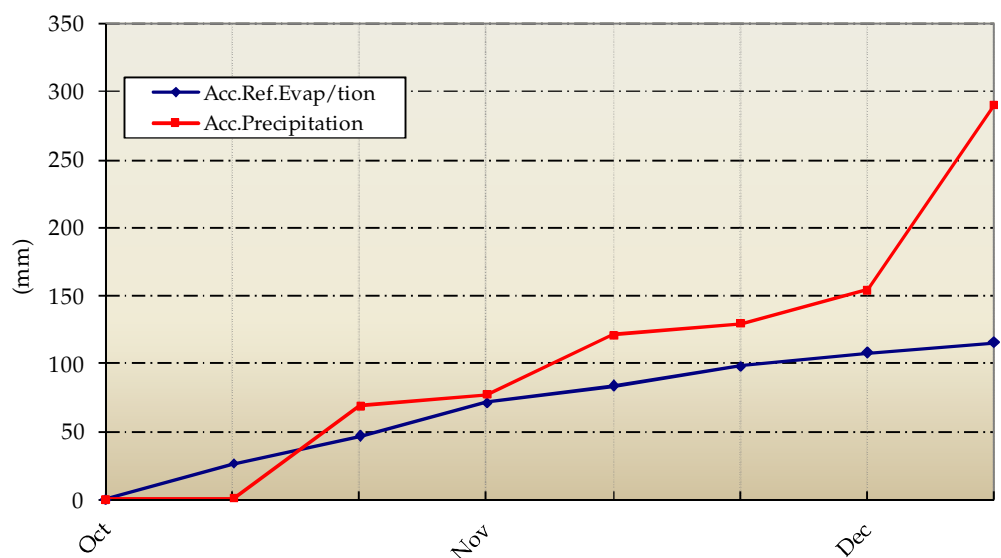
Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
www.meteo.gov.gr
www.meteohellas.gr

2nd 10-day period (11- 20/01/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	-	-	-	-	-	-	-	-	-		11.0	13.5
	Min	6.0	-	-	3.8	7.4	9.4	7.6	9.4	-	-	7.3	-3.0	2.5
Relative Humidity	Max	-	-	94	88	94	95	97	-	-	88	93	91	-
	Min	-	-	42	52	55	58	82	-	-	45	56	45	-
Soil Temperature at 10 cm	06 UTC	7.4	-	-	7.6	8.8	10.0	9.4	10.0	-	-	8.9	4.3	6.8
	12 UTC	8.2	-	-	-	9.6	-	9.6	10.2	-	-	9.4	5.1	8.7
Sunshine Duration		-	-	8.8	6.5	1.3	2.2	0.0	-	-	3.2	3.7	6.7	4.2
Precipitation		12.0				3.0	10.0	21.6	53.7			-	0.5	31.5
Evaporation		-	-	2.0	4.0	2.0	13.6	2.8	-	-	2.0	-	14.1	12.8
Growing Degrees	5	-	-	-	-	-	-	-	-	-	-	-	4.0	31.3
	10	-	-	-	-	-	-	-	-	-	-	-	0.0	3.9

2nd 10-day period (11- 20/01/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	6.0	9.4
Precipitation - Reference Evapotranspiration	-	-5.5	22.1
Number of Rainy Days	5.0	2.0	3.1
Number of Dry Days	10.0	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

This station is not fully operated

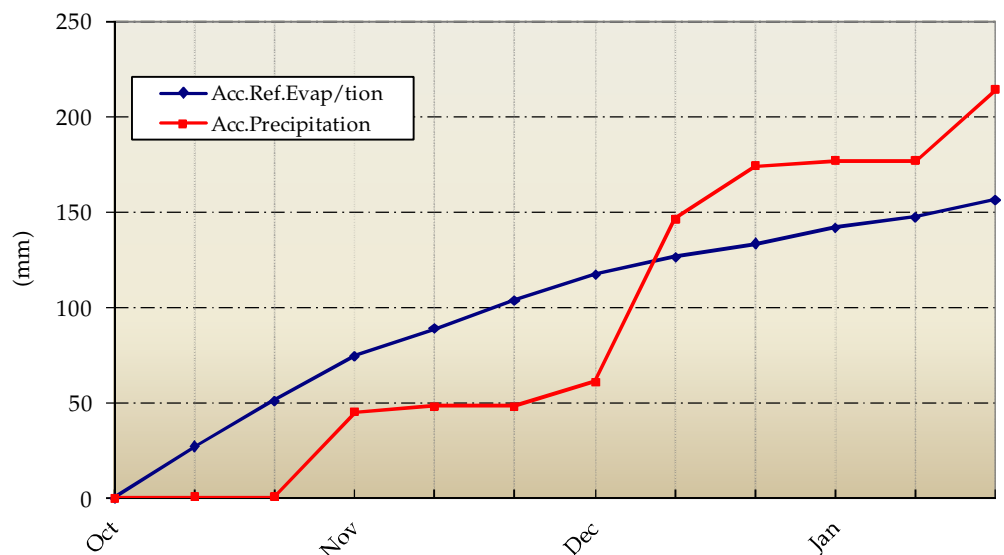


Alexandroupoli

2nd 10-day period (11- 20/01/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	11.2	10.4	8.8	10.4	14.0	13.6	14.0	13.2	13.0	14.4	12.3	5.8	8.0
	Min	2.6	5.0	1.6	-1.8	3.6	9.0	9.0	8.6	8.6	4.8	5.1	-2.6	0.2
Relative Humidity	Max	95	94	93	93	93	100	90	97	87	93	94	88	-
	Min	85	73	46	62	65	76	52	77	57	52	64	53	-
Soil Temperature at 10 cm	06 UTC	3.6	5.6	5.4	3.8	4.8	8.2	9.8	9.6	9.0	7.2	6.7	2.9	4.2
	12 UTC	5.0	6.8	6.2	5.4	6.8	9.2	9.4	10.4	9.4	9.2	7.8	3.3	5.1
Sunshine Duration		0.0	3.6	6.0	5.6	4.3	0.0	8.1	0.0	4.7	4.6	3.7	3.7	3.1
Precipitation		0.3	1.3	0.0			2.4		28.9	4.6		37.5	9.1	11.4
Evaporation		0.0	-	0.0	0.0	1.8	1.8	2.0	1.4	3.6	3.3	-	3.1	6.6
Growing Degrees	5	1.9	2.7	0.2	0.0	3.8	6.3	6.5	5.9	5.8	4.6	37.7	0.6	9.4
	10	0.0	0.0	0.0	0.0	0.0	1.3	1.5	0.9	0.8	0.0	4.5	0.0	0.9

2nd 10-day period (11- 20/01/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.0	6.0	8.8
Precipitation - Reference Evapotranspiration	28.5	3.1	2.6
Number of Rainy Days	5.0	1.0	2.2
Number of Dry Days	12.0	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

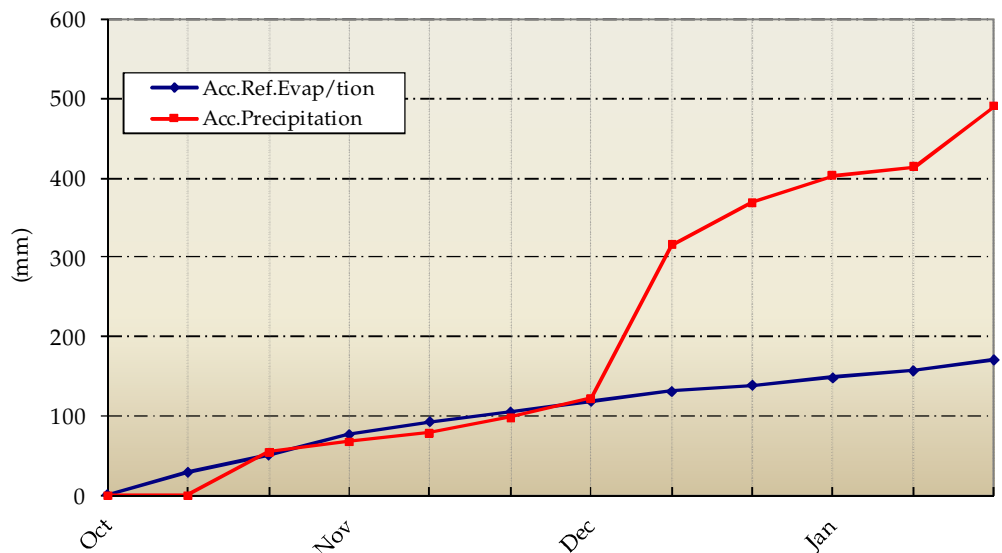


Andravida

2nd 10-day period (11- 20/01/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.0	14.7	16.2	16.8	17.6	15.0	15.4	14.3	14.4	17.5	15.8	11.4	13.6
	Min	9.2	9.1	5.2	6.9	8.4	9.2	9.1	8.8	7.3	9.8	8.3	0.7	4.8
Relative Humidity	Max	93	89	89	75	83	92	93	90	85	76	86	85	-
	Min	57	62	42	53	55	61	72	49	46	60	56	41	-
Soil Temperature at 10 cm	06 UTC	9.4	10.2	8.6	9.4	10.0	11.4	10.2	11.4	9.8	11.4	10.2	5.1	8.3
	12 UTC	11.0	11.2	10.8	11.2	11.4	11.6	12.0	11.4	12.0	13.4	11.6	7.4	9.8
Sunshine Duration		2.3	3.1	8.1	8.1	4.4	2.5	0.0	1.3	6.7	6.7	4.3	6.6	4.4
Precipitation		14.2	3.9				22.6	17.0	14.2	3.8	0.1	75.8	3.7	33.0
Evaporation		0.3	3.9	1.5	2.6	0.9	0.4	0.7	3.1	1.2	2.5	17.1	-	18.1
Growing Degrees	5	7.6	6.9	5.7	6.9	8.0	7.1	7.3	6.6	5.9	8.7	70.5	16.8	42.4
	10	2.6	1.9	0.7	1.9	3.0	2.1	2.3	1.6	0.9	3.7	20.5	0.3	7.2

2nd 10-day period (11- 20/01/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.8	11.0	9.4
Precipitation - Reference Evapotranspiration	62.0	-7.3	23.6
Number of Rainy Days	7.0	2.0	3.7
Number of Dry Days	0.0	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

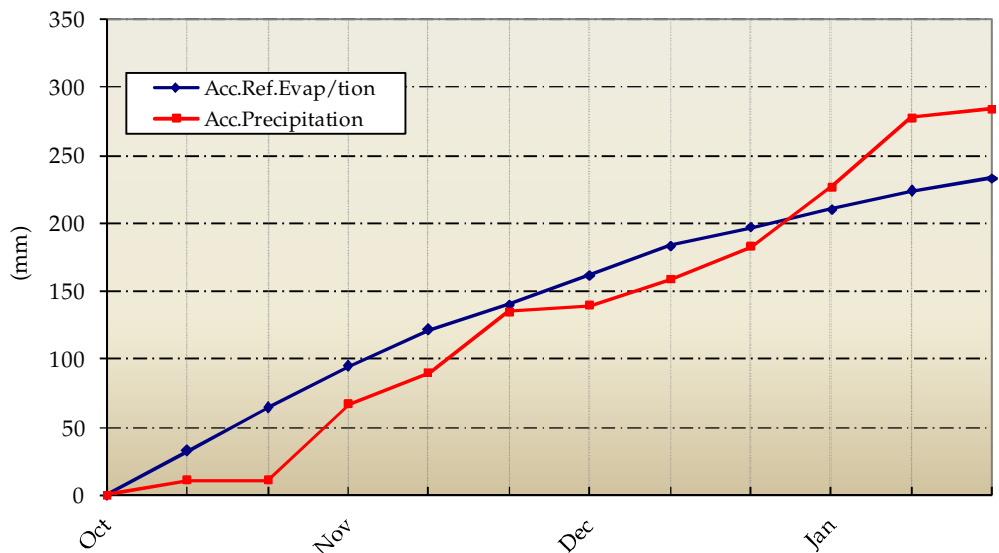


Iraklio

2nd 10-day period (11- 20/01/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.6	20.0	16.2	16.4	18.4	18.4	17.4	18.2	16.0	20.0	18.0	-	14.7
	Min	8.0	13.0	10.6	8.2	9.0	13.2	11.0	12.4	10.6	12.2	10.8	-	9.1
Relative Humidity	Max	76	82	84	89	87	80	70	78	85	80	81	-	-
	Min	55	55	67	55	52	59	52	52	58	40	54	-	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		6.2	5.3	8.1	7.4	8.0	6.3	3.2	3.1	4.9	8.3	6.1	-	3.7
Precipitation							0.0	0.6	4.7	1.5		6.8	-	28.7
Evaporation		2.0	0.8	1.4	-	0.8	2.8	2.5	0.6	1.5	3.9	-	-	24.1
Growing Degrees	5	8.3	11.5	8.4	7.3	8.7	10.8	9.2	10.3	8.3	11.1	93.9	-	68.9
	10	3.3	6.5	3.4	2.3	3.7	5.8	4.2	5.3	3.3	6.1	43.9	-	21.0

2nd 10-day period (11- 20/01/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	10.0	-	-
Precipitation - Reference Evapotranspiration	-3.2	-	28.7
Number of Rainy Days	3.0	-	4.2
Number of Dry Days	7.0	-	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

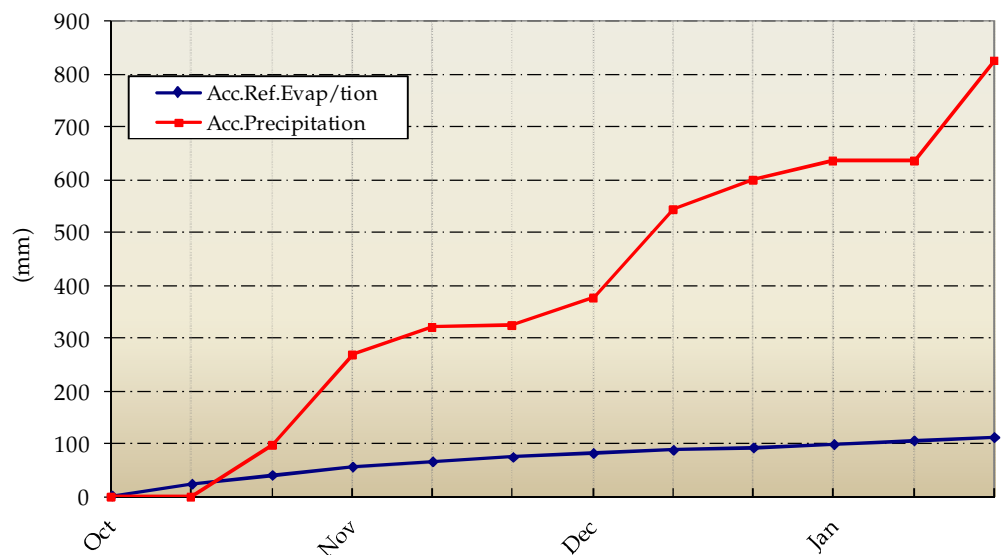


Ioannina

2nd 10-day period (11- 20/01/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	9.4	9.0	7.6	12.0	11.2	10.4	9.0	8.6	5.0	11.6	9.4	6.3	8.7
	Min	4.0	5.0	-1.0	6.6	7.5	5.0	3.0	0.6	0.6	4.0	3.5	-6.0	-0.4
Relative Humidity	Max	97	97	96	88	95	97	97	97	93	97	95	88	-
	Min	76	61	71	60	50	78	89	84	87	81	74	36	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	3.2
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	3.8
Sunshine Duration		0.0	1.4	1.4	1.8	0.0	0.8	0.0	0.0	0.0	0.0	0.5	5.2	3.0
Precipitation		23.5	18.3			4.5	32.4	43.1	54.4	6.0	8.2	190.4	4.1	26.9
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	4.4
Growing Degrees	5	1.7	2.0	0.0	4.3	4.4	2.7	1.0	0.0	0.0	2.8	18.9	0.4	9.3
	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	0.3

2nd 10-day period (11- 20/01/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	6.7	7.1	6.6
Precipitation - Reference Evapotranspiration	183.7	-3.0	20.3
Number of Rainy Days	8.0	1.0	2.9
Number of Dry Days	0.0	6.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

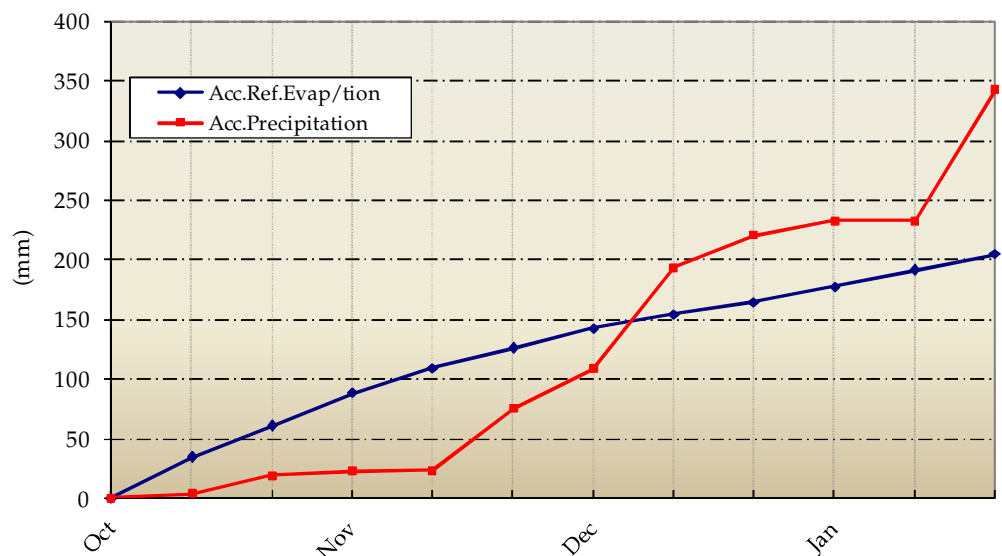


Kalamata

2nd 10-day period (11- 20/01/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	16.8	16.2	17.8	16.4	17.6	16.6	15.6	14.2	12.6	17.6	16.1	12.8	14.6
	Min	8.8	7.0	3.6	5.0	5.5	10.1	9.0	8.6	6.8	6.0	7.0	0.6	4.9
Relative Humidity	Max	92	94	94	86	92	95	93	95	93	93	93	90	-
	Min	56	56	33	57	64	55	68	61	66	67	58	38	-
Soil Temperature at 10 cm	06 UTC	9.6	10.4	10.0	9.8	10.4	11.6	11.4	11.6	10.6	10.6	10.6	7.1	9.0
	12 UTC	8.8	11.0	10.4	11.0	11.2	12.2	12.2	11.8	11.0	11.4	11.1	8.1	10.1
Sunshine Duration		4.0	5.2	8.1	3.0	3.3	5.2	0.0	0.5	2.5	6.5	3.8	7.0	4.2
Precipitation		7.7	2.2		0.0	7.3	23.5	33.1	29.0	6.5		109.3	1.2	33.9
Evaporation		0.3	2.2	0.5	0.8	2.5	4.9	5.2	0.9	1.2	1.2	19.7	-	23.4
Growing Degrees	5	7.8	6.6	5.7	5.7	6.6	8.4	7.3	6.4	4.7	6.8	65.9	18.1	47.5
	10	2.8	1.6	0.7	0.7	1.6	3.4	2.3	1.4	0.0	1.8	16.2	0.0	8.1

2nd 10-day period (11- 20/01/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	13.3	13.2	11.1
Precipitation - Reference Evapotranspiration	96.0	-12.0	22.8
Number of Rainy Days	7.0	2.0	3.8
Number of Dry Days	12.0	4.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

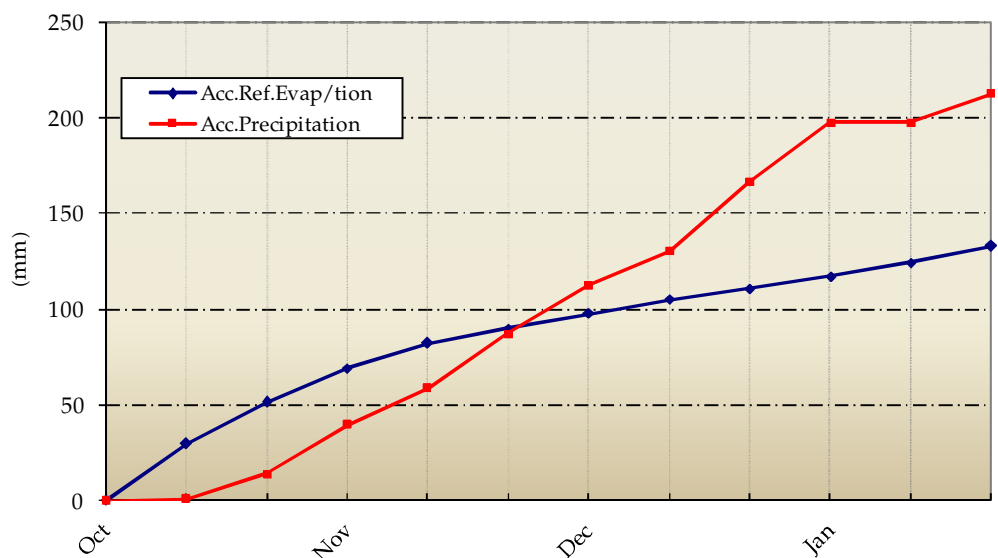


Larisa

2nd 10-day period (11- 20/01/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	11.0	12.0	11.0	14.2	15.4	14.6	13.2	14.8	13.4	14.2	13.4	8.4	9.3
	Min	0.6	3.0	-1.4	0.4	1.2	5.6	1.6	3.0	2.0	3.4	1.9	-5.1	0.0
Relative Humidity	Max	100	100	100	99	100	100	97	98	97	94	98	87	-
	Min	64	66	49	61	63	53	60	36	41	48	54	37	-
Soil Temperature at 10 cm	06 UTC	4.8	6.2	4.8	5.4	6.2	8.2	7.2	8.6	7.4	7.4	6.6	3.9	5.0
	12 UTC	6.0	6.8	6.2	7.4	8.0	9.2	8.0	9.4	8.6	8.4	7.8	5.9	5.5
Sunshine Duration		6.7	4.0	7.2	4.7	4.7	7.0	2.2	3.4	7.0	2.9	5.0	6.4	3.6
Precipitation		2.9	0.3				11.3	0.6	0.1			15.2		8.6
Evaporation		0.7	0.7	0.4	0.2	6.0	0.2	0.3	0.3	2.8	0.3	11.9	11.0	5.9
Growing Degrees	5	0.8	2.5	0.0	2.3	3.3	5.1	2.4	3.9	2.7	3.8	26.8	0.1	9.7
	10	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.4

2nd 10-day period (11- 20/01/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	8.5	7.5	6.4
Precipitation - Reference Evapotranspiration	6.7	-7.5	2.2
Number of Rainy Days	5.0	0.0	2.6
Number of Dry Days	11.0	13.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

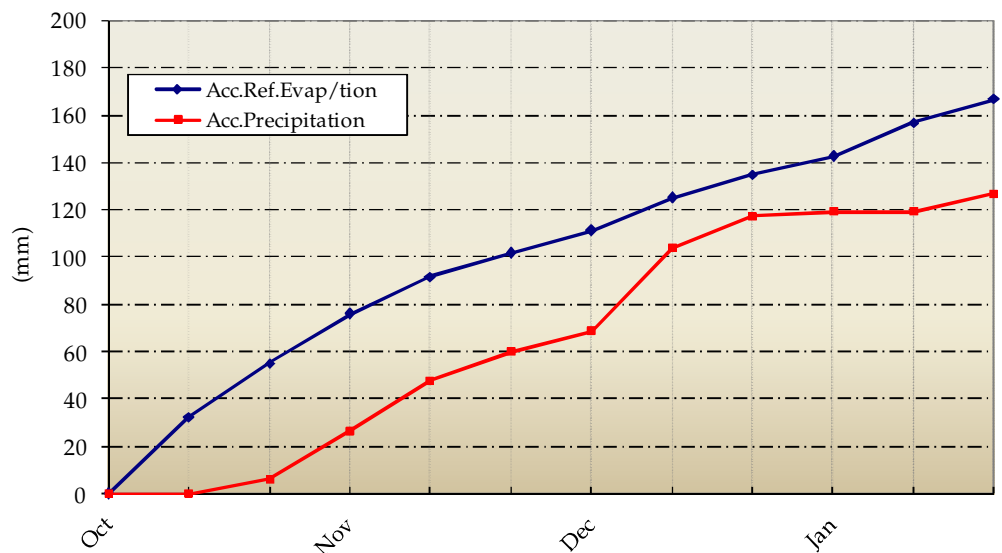


Mikra

2nd 10-day period (11- 20/01/2013)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	10.1	8.8	8.0	10.1	14.8	16.6	14.2	15.0	13.0	13.2	12.4	6.3	8.8
	Min	0.8	2.2	-3.1	3.4	3.6	9.4	4.0	6.8	1.6	3.4	3.2	-2.0	1.1
Relative Humidity	Max	91	94	83	85	92	86	84	87	90	87	88	76	-
	Min	72	43	45	73	62	40	50	55	38	35	51	43	-
Soil Temperature at 10 cm	06 UTC	4.8	5.4	4.0	5.6	6.8	9.2	8.2	8.4	7.0	7.0	6.6	2.6	4.3
	12 UTC	6.4	9.2	9.0	7.0	7.0	10.0	9.0	9.0	9.4	8.4	8.4	3.7	5.7
Sunshine Duration		4.8	4.6	8.0	1.2	0.8	8.1	1.9	0.9	7.8	3.2	4.1	6.8	3.6
Precipitation		0.8	3.8				2.8		0.3			7.7	0.2	6.6
Evaporation		2.2	0.0	0.0	2.9	0.9	3.6	0.5	0.6	1.0	1.8	13.5	9.1	10.5
Growing Degrees	5	0.5	0.5	0.0	1.8	4.2	8.0	4.1	5.9	2.3	3.3	30.5	0.4	11.4
	10	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.9	0.0	0.0	3.9	0.0	0.9

2nd 10-day period (11- 20/01/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	9.9	13.0	8.8
Precipitation - Reference Evapotranspiration	-2.2	-12.8	-2.2
Number of Rainy Days	4.0	1.0	2.2
Number of Dry Days	12.0	6.0	-

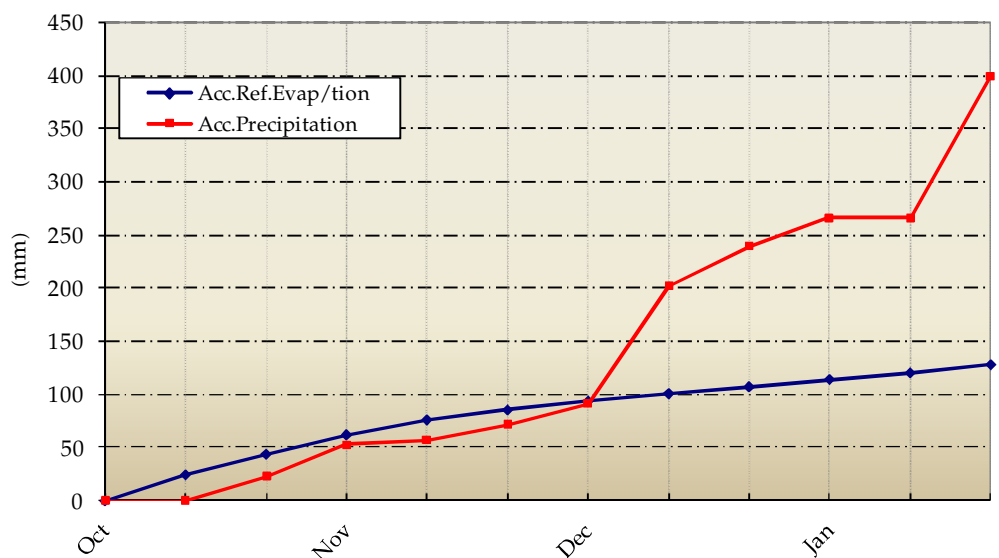
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11- 20/01/2013)		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	10.9	13.0	12.8	12.9	11.9	10.2	8.1	9.1	14.2	11.5	7.6	9.4
	Min	4.5	5.6	-2.3	-1.9	3.6	4.5	4.3	2.0	1.3	4.6	2.6	-4.7	0.1
Relative Humidity	Max	90	83	98	100	96	98	97	97	80	82	92	80	-
	Min	62	73	85	57	62	54	78	71	74	77	69	38	-
Soil Temperature at 10 cm	06 UTC	4.4	5.4	2.4	3.0	5.2	6.8	5.6	6.6	4.4	6.0	5.0	1.8	4.3
	12 UTC	6.8	-	-	5.6	7.4	8.6	7.6	7.0	-	-	7.2	2.5	5.0
Sunshine Duration		3.9	4.3	7.5	3.7	2.8	5.2	0.0	0.3	6.9	2.5	3.7	6.6	4.1
Precipitation		11.9	5.8				19.2	41.7	43.3	12.0		133.9	2.1	31.6
Evaporation		1.1	1.0	0.5	0.5	0.0	0.0	0.0	0.6	1.8	0.3	5.8	-	5.6
Growing Degrees	5	3.3	3.3	0.4	0.5	3.3	3.2	2.3	0.1	0.2	4.4	20.7	3.5	10.8
	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	0.5

2nd 10-day period (11- 20/01/2013)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	7.6	8.1	8.5
Precipitation - Reference Evapotranspiration	126.3	-6.0	23.1
Number of Rainy Days	6.0	1.0	3.7
Number of Dry Days	10.0	6.0	-

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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