



AGROMETEOROLOGICAL BULLETIN

March 2014
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

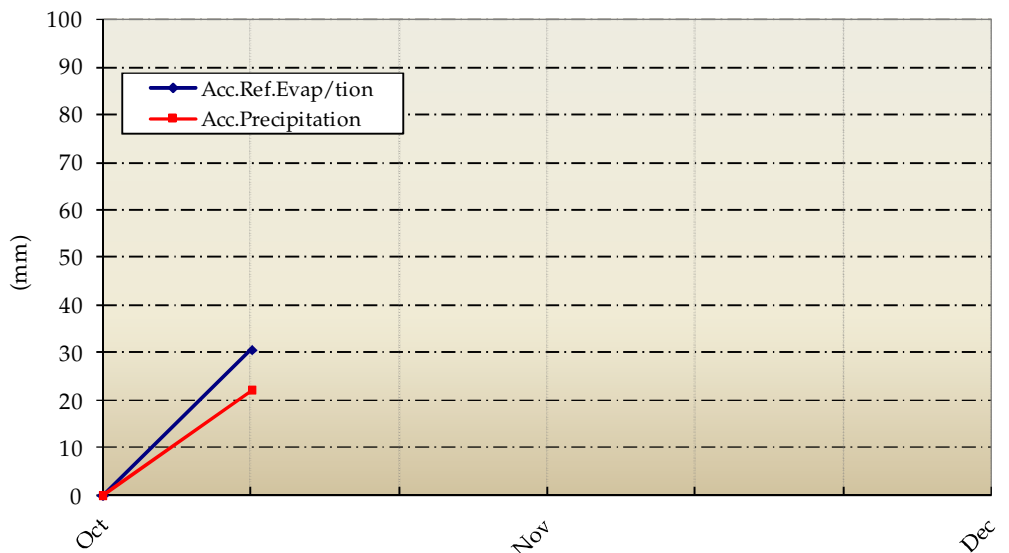
Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
www.meteo.gov.gr
www.meteohellas.gr

3rd 10-day period (21-31/03/2014)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	-	-	-	-	-	-	-	-	-	-			18.4
	Min	6.0	-	-	-	-	-	8.0	10.0	-	-	5.0	7.2	10.5	6.3
Relative Humidity	Max	-	-	-	-	-	95	95	-	-	97	97	96	93	-
	Min	-	-	-	-	-	63	61	-	-	60	51	59	64	-
Soil Temperature at 10 cm	06 UTC	12.8	-	-	-	-	-	14.0	13.6	-	-	12.8	13.3	12.9	10.5
	12 UTC	14.6	-	-	-	-	-	15.4	-	-	-	-	15.0	14.6	14.3
Sunshine Duration		-	-	-	-	-	0.0	2.7	-	-	0.0	11.0	3.4	3.3	6.1
Precipitation														26.8	24.6
Evaporation		-	-	-	-	-	0.0	0.0	-	-	0.0	0.0	-	-	38.9
Growing Degrees	5	-	-	-	-	-	-	-	-	-	-	-	-	-	80.5
	10	-	-	-	-	-	-	-	-	-	-	-	-	-	29.2

3rd 10-day period (21-31/03/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	-	26.3
Precipitation - Reference Evapotranspiration	-	-	-1.7
Number of Rainy Days	0.0	3.0	3.6
Number of Dry Days	24.0	10.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

This station is not fully operated

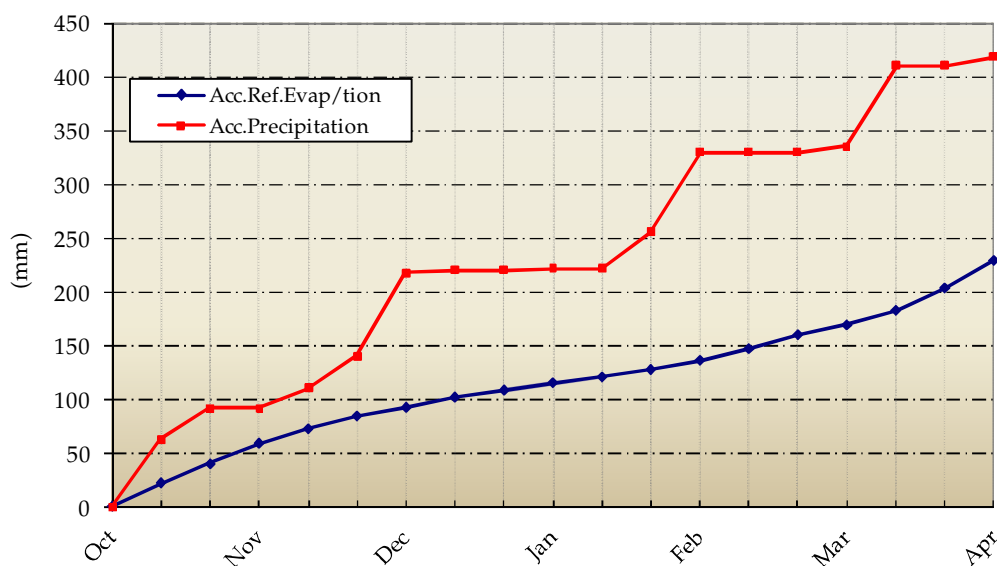


Alexandroupoli

3rd 10-day period (21-31/03/2014)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.6	17.4	17.4	17.4	17.4	14.6	17.0	18.6	18.6	12.2	15.2	16.9	14.9	14.1
	Min	5.0	5.8	5.0	6.2	9.8	5.2	6.2	11.6	7.6	2.8	0.0	5.9	6.7	4.9
Relative Humidity	Max	94	94	94	97	91	94	97	95	95	76	93	93	90	-
	Min	30	43	65	52	50	73	66	67	37	28	30	49	59	-
Soil Temperature at 10 cm	06 UTC	10.6	11.4	11.4	11.8	14.2	12.0	11.2	12.8	12.4	10.0	9.4	11.6	10.5	8.3
	12 UTC	15.5	15.6	15.2	16.0	15.4	13.0	14.0	16.0	14.6	13.2	14.4	14.8	13.3	11.0
Sunshine Duration		10.6	11.2	8.6	7.2	7.0	1.0	2.7	6.9	5.0	11.2	11.3	7.5	4.5	5.5
Precipitation						0.4	5.2	3.1	0.0				8.7	25.8	15.2
Evaporation		5.7	1.0	4.9	2.6	1.8	1.3	1.7	0.7	4.3	5.7	2.8	32.5	-	32.3
Growing Degrees	5	7.8	6.6	6.2	6.8	8.6	4.9	6.6	10.1	8.1	2.5	2.6	70.8	63.9	51.2
	10	2.8	1.6	1.2	1.8	3.6	0.0	1.6	5.1	3.1	0.0	0.0	20.8	13.1	11.3

3rd 10-day period (21-31/03/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	25.8	21.7	23.3
Precipitation - Reference Evapotranspiration	-17.1	4.1	-8.1
Number of Rainy Days	3.0	3.0	2.7
Number of Dry Days	13.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

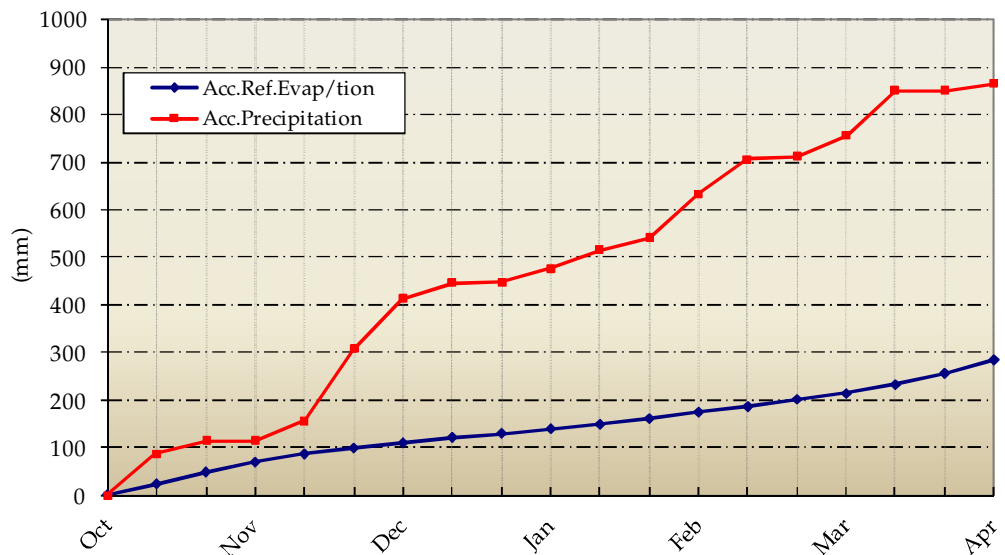


Andravida

3rd 10-day period (21-31/03/2014)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.4	18.4	19.0	18.4	16.2	18.0	21.2	17.0	18.9	19.8	19.3	18.8	19.7	17.4
	Min	8.0	8.2	10.6	9.7	7.4	9.6	8.3	9.0	9.2	5.7	5.9	8.3	9.9	7.7
Relative Humidity	Max	91	91	90	90	86	89	89	89	91	88	90	89	86	-
	Min	40	55	53	55	50	53	47	57	46	45	51	50	48	-
Soil Temperature at 10 cm	06 UTC	14.8	14.4	15.2	15.4	14.2	14.2	14.4	14.0	14.0	13.6	12.8	14.3	14.2	11.5
	12 UTC	19.0	18.8	19.2	19.0	17.8	16.2	16.4	16.2	17.2	17.4	17.0	17.7	17.2	14.2
Sunshine Duration		10.1	6.4	9.7	5.3	8.8	4.8	0.1	6.8	6.5	10.2	10.1	7.2	6.7	6.8
Precipitation					4.6	2.7	6.8						14.1	11.0	19.5
Evaporation		0.7	9.2	2.8	4.2	12.7	0.2	-	0.2	3.0	5.4	1.8	-	-	33.3
Growing Degrees	5	9.2	8.3	9.8	9.1	6.8	8.8	9.8	8.0	9.1	7.8	7.6	94.1	108.0	83.1
	10	4.2	3.3	4.8	4.1	1.8	3.8	4.8	3.0	4.1	2.8	2.6	39.1	53.0	30.3

3rd 10-day period (21-31/03/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	28.5	31.3	27.1
Precipitation - Reference Evapotranspiration	-14.4	-20.3	-7.6
Number of Rainy Days	3.0	4.0	3.2
Number of Dry Days	15.0	5.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

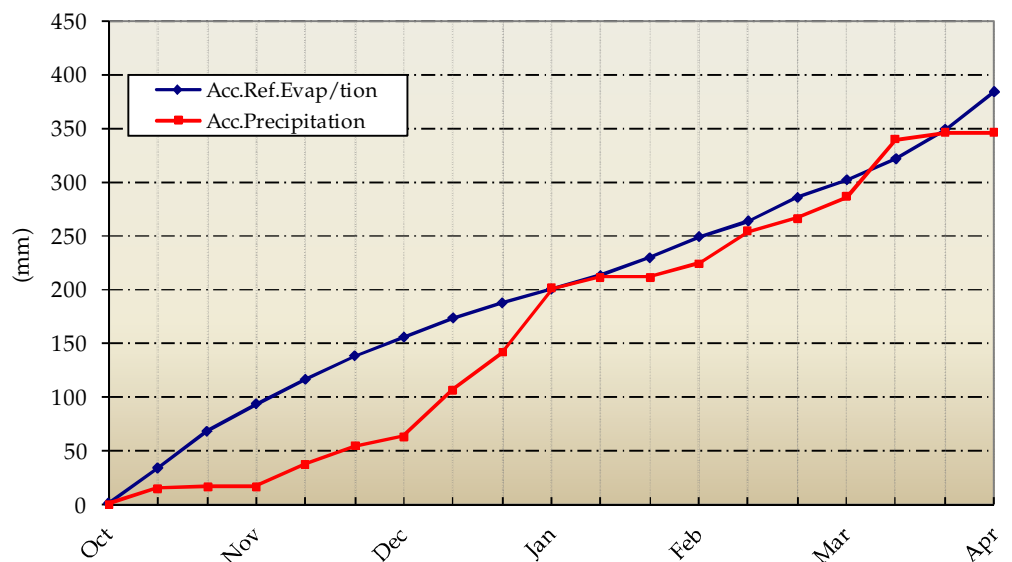


Iraklio

3rd 10-day period (21-31/03/2014)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	17.8	18.0	18.0	19.0	18.0	18.5	25.0	18.6	18.5	15.8	16.6	18.5	21.4	17.7
	Min	14.4	9.0	10.0	9.6	12.2	9.6	13.0	16.6	10.0	13.4	9.0	11.5	13.2	10.5
Relative Humidity	Max	87	88	90	90	86	79	64	87	79	75	82	82	80	-
	Min	63	65	61	69	50	47	31	56	60	49	58	55	41	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunshine Duration		8.1	9.4	8.7	8.1	8.1	9.7	8.8	7.3	9.5	8.3	9.0	8.6	6.8	6.6
Precipitation															15.8
Evaporation		4.4	1.1	0.9	2.7	1.9	4.7	3.4	6.1	2.5	5.8	2.9	36.4	42.8	48.5
Growing Degrees	5	11.1	8.5	9.0	9.3	10.1	9.1	14.0	12.6	9.3	9.6	7.8	110.3	135.5	100.1
	10	6.1	3.5	4.0	4.3	5.1	4.1	9.0	7.6	4.3	4.6	2.8	55.3	80.5	45.5

3rd 10-day period (21-31/03/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	35.0	41.4	-
Precipitation - Reference Evapotranspiration	-35.0	-41.4	15.8
Number of Rainy Days	0.0	0.0	3.0
Number of Dry Days	14.0	14.0	-

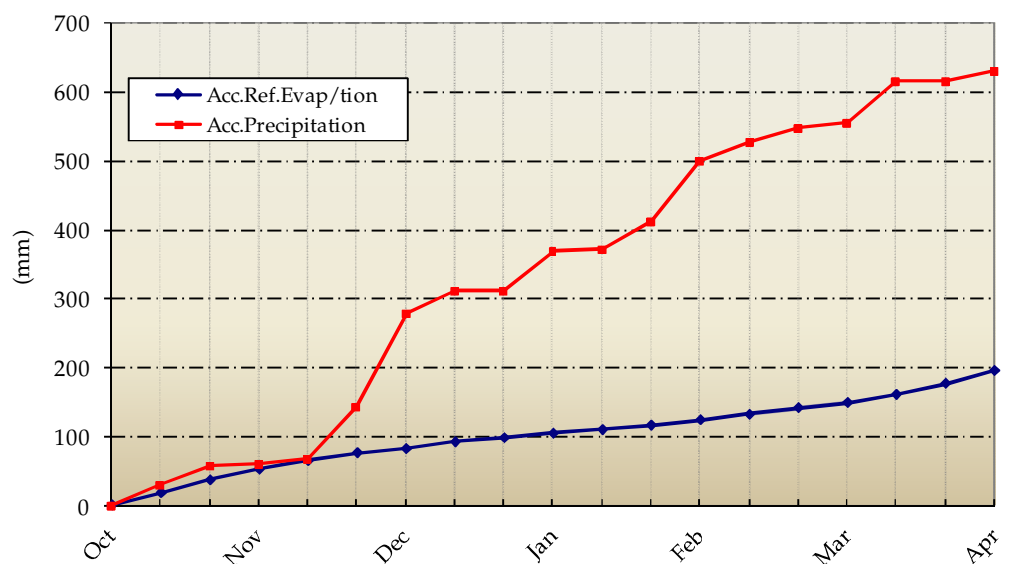
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



3rd 10-day period (21-31/03/2014)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.6	19.1	17.4	14.5	12.4	14.2	16.0	9.2	18.1	19.6	20.1	16.5	16.3	15.1
	Min	1.2	1.0	1.5	5.5	3.0	6.5	6.2	4.2	3.3	1.2	1.0	3.1	5.7	4.4
Relative Humidity	Max	92	95	97	95	95	94	97	97	95	89	98	95	95	-
	Min	14	32	28	41	40	54	38	81	33	28	30	38	39	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	7.9
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	-	10.5
Sunshine Duration		7.4	9.0	3.2	8.2	1.3	3.8	1.0	0.3	7.6	8.6	8.5	5.4	3.8	4.7
Precipitation					8.6	2.7	1.7	0.5	2.5	0.1			16.1	57.7	32.3
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	-	28.9
Growing Degrees	5	5.9	5.1	4.5	5.0	2.7	5.4	6.1	1.7	5.7	5.4	5.6	52.9	66.0	50.7
	10	0.9	0.1	0.0	0.0	0.0	0.4	1.1	0.0	0.7	0.4	0.6	4.1	17.1	11.1

3rd 10-day period (21-31/03/2014)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	18.9	24.9
Precipitation - Reference Evapotranspiration	-2.8	32.8
Number of Rainy Days	6.0	8.0
Number of Dry Days	18.0	2.0

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

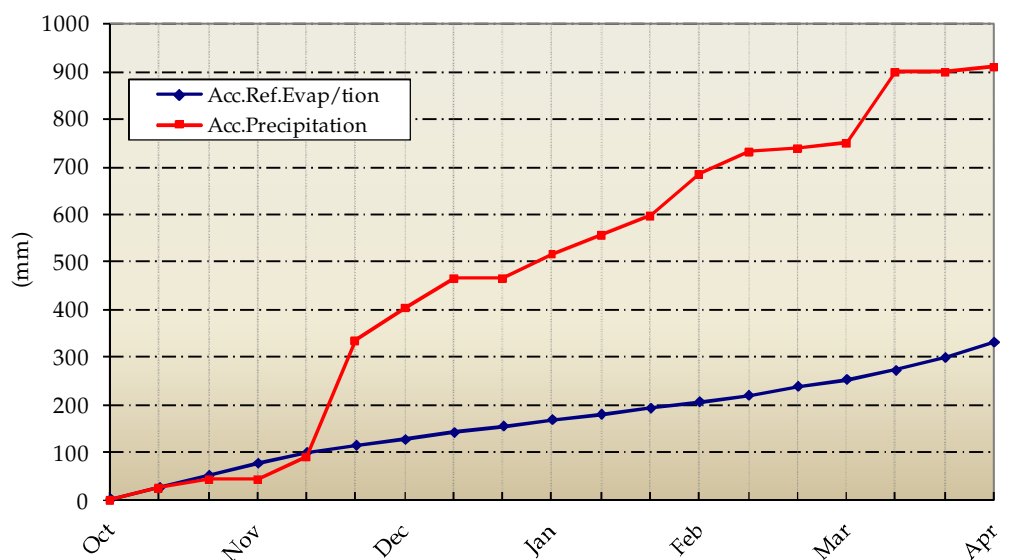


Kalamata

3rd 10-day period (21-31/03/2014)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	21.1	19.6	21.7	19.6	18.2	17.9	20.9	19.9	19.5	22.1	18.8	19.9	20.0	17.8
	Min	6.8	6.3	7.8	8.9	7.8	7.8	7.4	6.9	8.2	6.9	6.4	7.4	9.2	6.9
Relative Humidity	Max	88	92	93	93	91	94	95	94	94	77	92	91	89	-
	Min	33	47	46	52	38	68	57	45	43	33	36	45	46	-
Soil Temperature at 10 cm	06 UTC	13.8	14.0	14.4	14.4	14.4	14.0	13.6	14.0	13.4	14.0	14.0	14.0	13.7	11.8
	12 UTC	15.0	14.4	14.8	15.6	15.2	14.6	14.8	15.2	15.0	15.2	15.2	15.0	14.9	14.2
Sunshine Duration		10.1	9.1	10.2	6.2	8.2	3.9	4.1	10.1	8.9	10.6	8.6	8.2	5.9	6.5
Precipitation						4.7	3.8			1.3			9.8	8.9	20.1
Evaporation		-	-	-	-	-	-	-	-	-	-	-	-	44.2	37.4
Growing Degrees	5	9.0	8.0	9.8	9.3	8.0	7.9	9.2	8.4	8.9	9.5	7.6	95.3	105.7	81.3
	10	4.0	3.0	4.8	4.3	3.0	2.9	4.2	3.4	3.9	4.5	2.6	40.3	50.7	28.3

3rd 10-day period (21-31/03/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	32.2	31.6	27.8
Precipitation - Reference Evapotranspiration	-22.4	-22.7	-7.7
Number of Rainy Days	3.0	2.0	3.3
Number of Dry Days	17.0	3.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

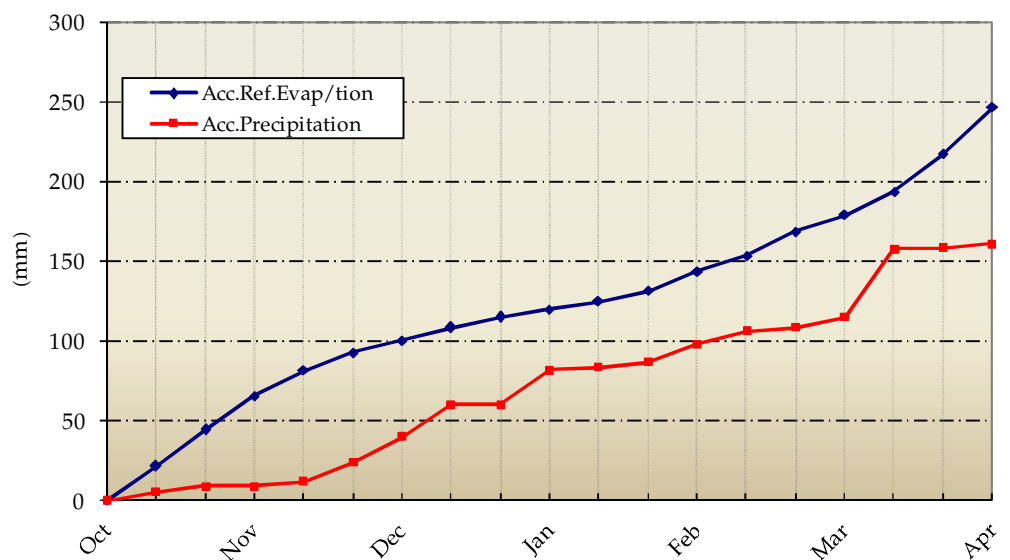


Larisa

3rd 10-day period (21-31/03/2014)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	20.0	21.8	22.8	22.0	18.8	17.6	18.2	17.2	19.2	15.4	20.2	19.4	17.4	16.9
	Min	2.4	0.2	5.8	5.2	5.0	5.8	8.6	2.6	8.0	7.8	1.2	4.8	6.8	4.2
Relative Humidity	Max	97	96	91	93	71	88	100	100	100	94	100	94	90	-
	Min	30	21	31	23	23	47	57	46	41	54	34	37	53	-
Soil Temperature at 10 cm	06 UTC	-	-	-	-	-	-	-	-	-	-	-	-	11.6	10.0
	12 UTC	-	-	-	-	-	-	-	-	-	-	-	-	13.0	11.4
Sunshine Duration		9.0	7.3	9.6	6.2	9.7	3.8	4.4	2.9	6.9	2.2	9.7	6.5	4.3	6.0
Precipitation							1.8	0.2	0.2	0.5			2.7	6.7	11.3
Evaporation		5.9	4.6	6.3	4.0	10.7	1.5	2.9	2.2	2.3	4.1	7.1	51.6	45.8	32.5
Growing Degrees	5	6.2	6.0	9.3	8.6	6.9	6.7	8.4	4.9	8.6	6.6	5.7	77.9	77.8	61.7
	10	1.2	1.0	4.3	3.6	1.9	1.7	3.4	0.0	3.6	1.6	0.7	23.0	24.0	16.3

3rd 10-day period (21-31/03/2014)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	29.3	25.5	25.6
Precipitation - Reference Evapotranspiration	-26.6	-18.8	-14.3
Number of Rainy Days	4.0	4.0	3.1
Number of Dry Days	14.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

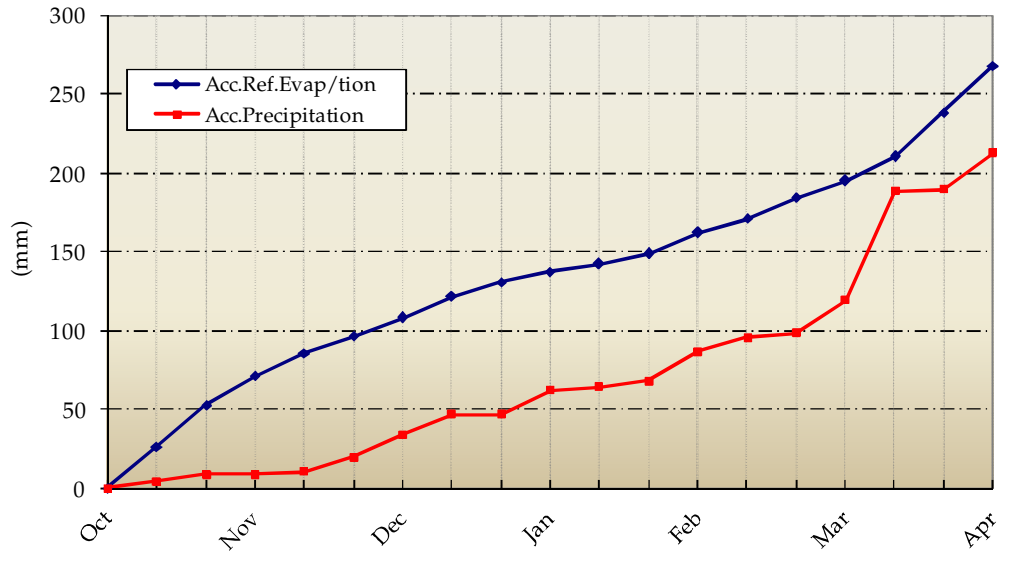


Mikra

3rd 10-day period (21-31/03/2014)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	19.6	20.6	21.2	20.9	18.9	17.2	16.8	17.0	20.0	14.8	17.0	18.5	15.6	16.0
	Min	5.0	4.8	7.1	8.2	11.7	8.5	7.4	8.2	10.4	9.1	5.8	7.8	8.8	5.7
Relative Humidity	Max	82	79	83	88	66	80	94	93	88	90	90	85	84	-
	Min	30	28	36	35	24	37	59	56	43	58	57	42	56	-
Soil Temperature at 10 cm	06 UTC	12.0	11.8	12.6	13.2	13.2	13.4	12.8	12.4	13.8	14.2	12.2	12.9	11.4	9.6
	12 UTC	14.4	14.2	14.8	15.0	14.8	14.2	14.2	14.6	15.2	14.2	14.6	14.6	12.7	12.9
Sunshine Duration		10.7	8.7	9.1	5.0	10.5	3.8	2.0	5.1	7.4	3.2	8.2	6.7	3.7	5.4
Precipitation							0.1	2.1	21.3	0.1			23.6	8.7	11.2
Evaporation		5.2	2.2	0.6	9.2	5.9	0.2	0.2	2.5	1.1	6.0	2.9	36.0	30.6	35.2
Growing Degrees	5	7.3	7.7	9.2	9.6	10.3	7.9	7.1	7.6	10.2	7.0	6.4	90.1	79.1	64.3
	10	2.3	2.7	4.2	4.6	5.3	2.9	2.1	2.6	5.2	2.0	1.4	35.1	24.9	17.2

3rd 10-day period (21-31/03/2014)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	29.8	24.2	25.7
Precipitation - Reference Evapotranspiration	-6.2	-15.5	-14.5
Number of Rainy Days	4.0	6.0	2.7
Number of Dry Days	14.0	2.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

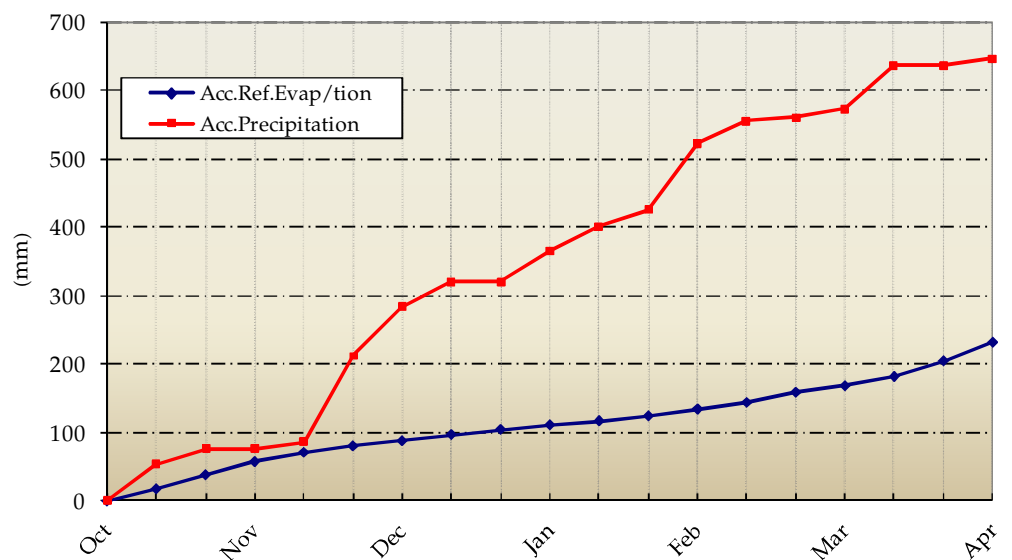


Tripoli

3rd 10-day period (21-31/03/2014)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	18.4	17.6	20.1	18.8	12.6	14.6	16.8	14.4	15.6	14.6	16.8	16.4	16.9	14.8
	Min	1.3	0.2	2.2	4.3	2.3	5.0	3.1	5.6	4.4	6.6	-1.0	3.1	5.4	3.1
Relative Humidity	Max	83	81	100	100	84	84	84	74	88	70	96	86	80	-
	Min	32	25	77	40	68	48	51	44	54	69	25	48	41	-
Soil Temperature at 10 cm	06 UTC	10.0	9.6	10.8	11.4	10.8	10.0	10.2	10.6	10.4	9.6	8.0	10.1	9.9	7.9
	12 UTC	14.4	14.8	-	14.6	-	13.0	14.2	14.0	13.4	-	14.8	14.2	13.7	9.5
Sunshine Duration		10.3	9.2	9.0	6.7	7.3	5.0	4.0	10.1	6.1	9.9	10.1	8.0	6.3	6.3
Precipitation						7.0	1.5		0.0	2.2			10.7	9.5	22.9
Evaporation		3.1	2.9	3.1	3.6	2.1	1.0	2.0	3.8	2.6	2.8	4.6	31.6	26.4	26.8
Growing Degrees	5	4.9	3.9	6.2	6.6	2.5	4.8	5.0	5.0	5.0	5.6	2.9	52.2	68.0	45.6
	10	0.0	0.0	1.2	1.6	0.0	0.0	0.0	0.0	0.0	0.6	0.0	3.3	16.9	7.9

3rd 10-day period (21-31/03/2014)	Previous Year Value	Past Years Mean Value	
Reference Evapotranspiration	27.3	26.7	25.6
Precipitation - Reference Evapotranspiration	-16.6	-17.2	-2.7
Number of Rainy Days	3.0	3.0	3.9
Number of Dry Days	13.0	4.0	-

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.

Mesurements 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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ΥΠΗΡΕΣΙΑ

HELLENIC NATIONAL METEOROLOGICAL SERVICE

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