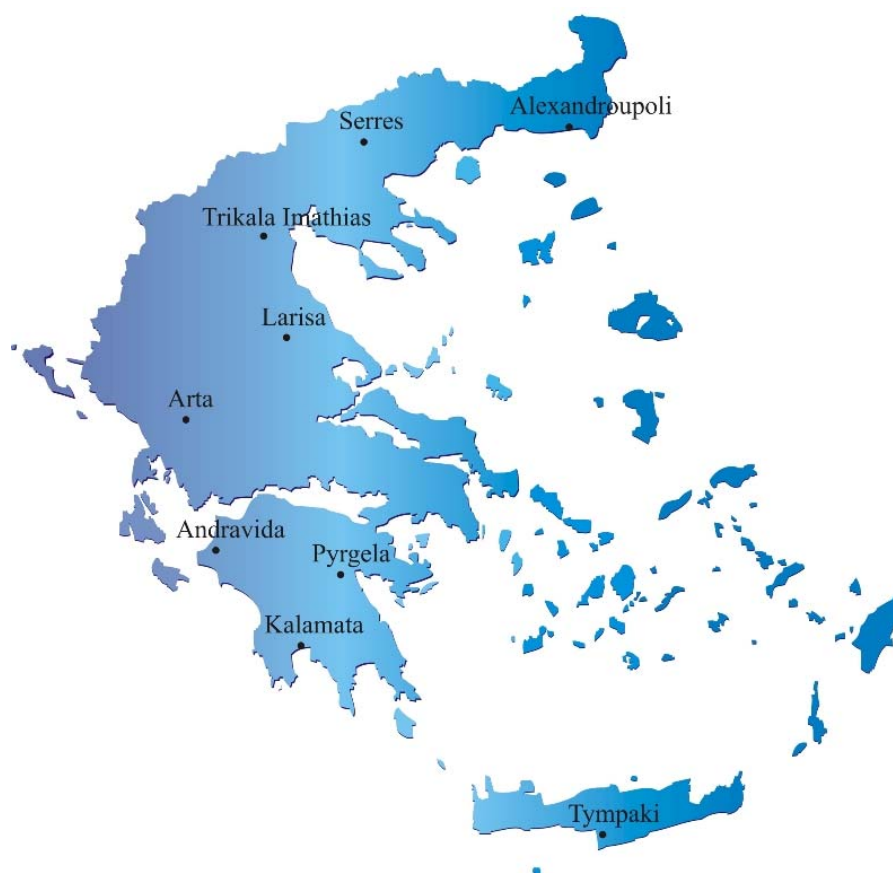


AGROMETEOROLOGICAL BULLETIN

July 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

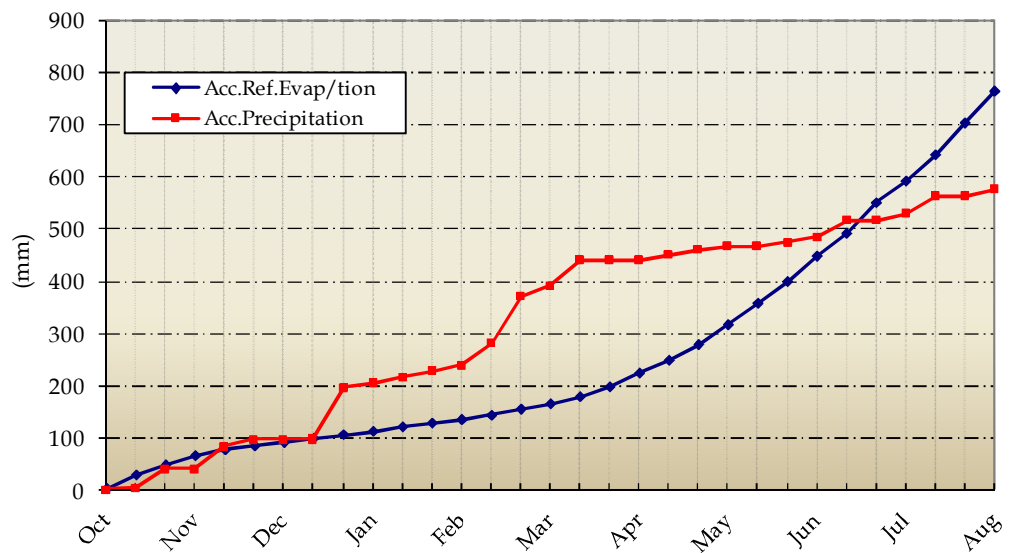
Web addresses of HNMS
www.hnms.gr
www.emy.gov.gr
www.meteo.gov.gr
www.meteohellas.gr

Alexandroupoli

3rd 10-day period (21-31/07/2010)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.2	34.0	33.8	32.0	33.0	29.2	28.2	28.2	31.0	32.0	32.0	31.3	32.9	30.8
	Min	23.4	21.0	23.0	23.4	22.6	21.8	17.8	18.4	18.0	21.2	21.8	21.1	20.5	18.1
Relative Humidity	Max	83	77	81	76	81	89	87	89	81	72	86	82	71	-
	Min	50	32	43	41	40	53	55	53	29	36	44	43	27	-
Soil Temperature at 10 cm	06 UTC	27.8	25.2	25.6	27.0	27.0	27.8	25.6	26.2	25.5	26.0	27.0	26.4	28.3	24.5
	12 UTC	30.0	28.4	29.0	30.0	30.2	29.0	28.5	28.6	28.2	30.0	29.0	29.2	32.0	28.7
Sunshine Duration		9.5	10.1	12.8	13.1	9.4	7.5	13.2	10.6	13.5	13.3	8.1	11.0	12.6	10.3
Precipitation		10.0	2.3			0.5	0.8		0.9				14.5		5.5
Evaporation		6.0	8.6	8.0	11.5	9.8	6.8	7.9	5.3	10.8	8.1	3.2	86.0	127.2	104.4
Growing Degrees	5	22.3	22.5	23.4	22.7	22.8	20.5	18.0	18.3	19.5	21.6	21.9	233.5	238.6	213.8
	10	17.3	17.5	18.4	17.7	17.8	15.5	13.0	13.3	14.5	16.6	16.9	178.5	183.6	158.8

3rd 10-day period (21-31/07/2010)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	61.2	71.3
Precipitation - Reference Evapotranspiration	-46.7	-71.3
Number of Rainy Days	5.0	0.0
Number of Dry Days	12.0	21.0

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

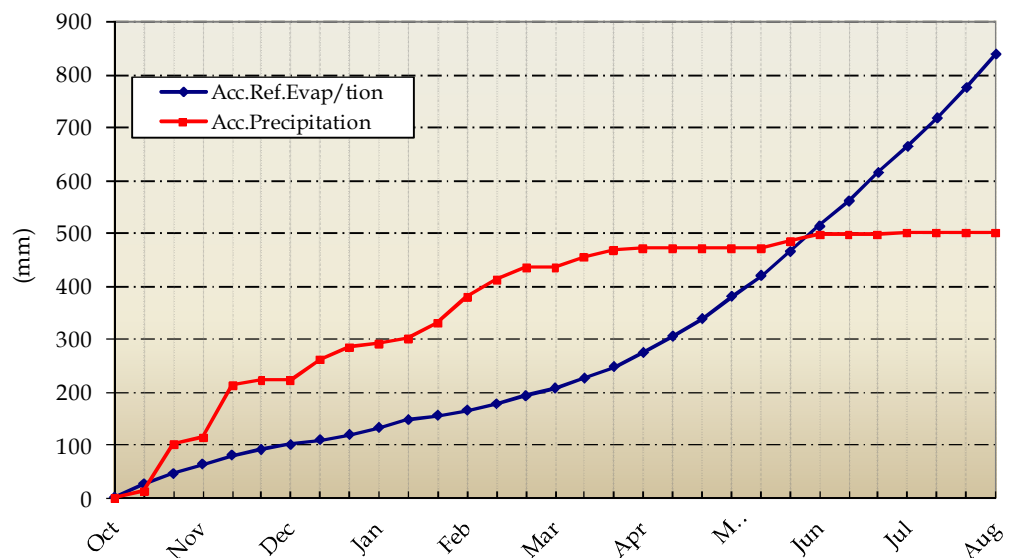


Andravida

3rd 10-day period (21-31/07/2010)		21	22	23	24	25	26	27	28	29	30	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.8	31.4	34.4	34.0	32.8	28.6	28.8	28.0	29.6	30.0	30.4	31.0	33.6	30.6
	Min	21.6	21.2	21.8	22.0	21.8	23.2	18.2	17.4	18.2	18.0	19.0	20.2	19.6	18.5
Relative Humidity	Max	91	91	91	90	91	81	88	88	90	88	89	89	87	-
	Min	37	50	36	32	35	49	37	47	40	34	42	40	33	-
Soil Temperature at 10 cm	06 UTC	29.0	30.0	30.0	30.0	30.4	29.6	28.2	28.0	27.4	27.6	28.2	28.9	28.6	27.4
	12 UTC	37.8	36.8	36.8	38.4	37.8	36.0	35.8	35.0	34.8	35.8	36.4	36.5	35.1	31.9
Sunshine Duration		12.3	12.3	12.4	12.2	12.0	12.0	12.7	12.6	12.8	12.7	12.6	12.4	12.3	11.8
Precipitation															2.9
Evaporation		3.7	11.7	11.7	9.6	8.8	8.2	9.4	8.0	4.1	14.1	9.6	98.9	111.5	81.3
Growing Degrees	5	22.2	21.3	23.1	23.0	22.3	20.9	18.5	17.7	18.9	19.0	19.7	226.6	237.6	215.1
	10	17.2	16.3	18.1	18.0	17.3	15.9	13.5	12.7	13.9	14.0	14.7	171.6	182.6	160.1

3rd 10-day period (21-31/07/2010)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	63.7	65.8
Precipitation - Reference Evapotranspiration	-63.7	-65.8
Number of Rainy Days	0.0	0.3
Number of Dry Days	38.0	37.0

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

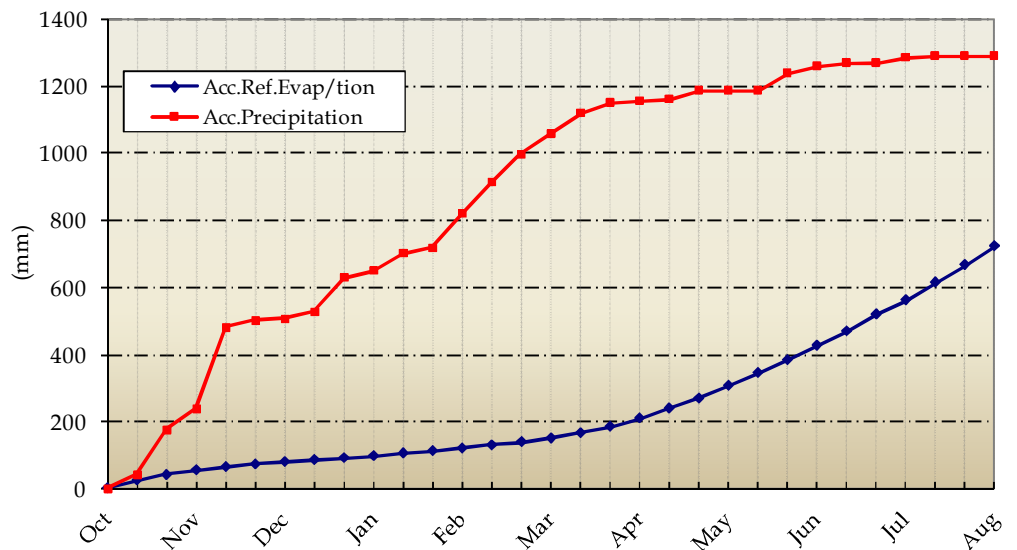


Arta

3rd 10-day period (21-31/07/2010)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.4	34.0	35.6	35.0	32.6	29.4	29.4	28.6	32.0	32.2	31.2	32.1	34.8	31.9
	Min	20.2	19.4	17.8	20.8	21.4	20.2	16.8	15.8	15.4	16.0	17.0	18.3	19.1	17.8
Relative Humidity	Max	93	84	95	87	88	78	87	89	77	78	97	87	75	-
	Min	38	43	30	48	33	50	45	28	38	34	27	38	37	-
Soil Temperature at 10 cm	06 UTC	27.8	28.4	26.2	28.2	28.6	28.8	27.6	27.6	26.8	26.8	27.0	27.6	29.3	26.9
	12 UTC	30.2	30.4	29.8	30.6	30.8	30.2	29.8	28.6	28.8	29.2	29.6	29.8	31.1	31.9
Sunshine Duration		12.8	8.1	13.2	12.6	12.8	10.8	12.7	9.5	12.7	12.6	12.6	11.9	12.4	10.9
Precipitation			1.4										1.4		4.3
Evaporation		7.8	6.1	6.8	7.1	8.2	6.7	7.0	7.1	7.7	7.0	7.7	79.2	81.0	-
Growing Degrees	5	21.8	21.7	21.7	22.9	22.0	19.8	18.1	17.2	18.7	19.1	19.1	222.1	241.8	218.0
	10	16.8	16.7	16.7	17.9	17.0	14.8	13.1	12.2	13.7	14.1	14.1	167.1	186.8	163.0

3rd 10-day period (21-31/07/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	56.3	64.2	54.2
Precipitation - Reference Evapotranspiration	-54.9	-64.2	-49.9
Number of Rainy Days	1.0	0.0	1.1
Number of Dry Days	3.0	26.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

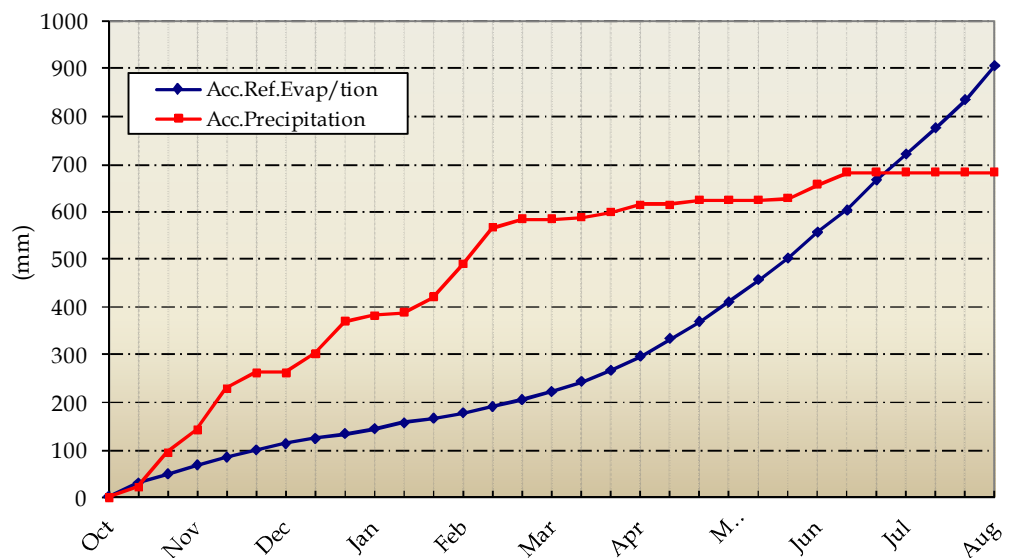


Kalamata

3rd 10-day period (21-31/07/2010)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	31.6	32.6	35.0	34.0	34.8	32.0	31.0	31.0	30.4	30.2	31.4	32.2	32.6	31.5
	Min	20.2	21.2	23.2	20.8	20.4	21.0	18.4	17.8	19.0	17.8	17.0	19.7	18.5	18.2
Relative Humidity	Max	81	84	82	82	85	85	85	84	78	76	87	83	86	-
	Min	44	39	33	40	27	29	32	32	33	36	33	34	37	-
Soil Temperature at 10 cm	06 UTC	26.0	26.4	26.4	26.6	26.6	26.4	26.2	25.2	25.0	26.0	25.2	26.0	25.4	26.0
	12 UTC	28.6	29.0	29.2	28.6	29.2	28.6	28.0	27.6	28.0	27.6	27.8	28.4	27.6	30.3
Sunshine Duration		12.4	12.2	12.6	12.0	12.5	12.6	12.3	12.5	12.5	12.9	12.6	12.5	11.9	11.2
Precipitation															0.9
Evaporation		3.0	7.6	8.2	3.2	10.1	10.7	8.3	10.7	9.0	6.4	8.8	86.0	95.0	90.1
Growing Degrees	5	20.9	21.9	24.1	22.4	22.6	21.5	19.7	19.4	19.7	19.0	19.2	230.4	225.9	218.3
	10	15.9	16.9	19.1	17.4	17.6	16.5	14.7	14.4	14.7	14.0	14.2	175.4	170.9	163.3

3rd 10-day period (21-31/07/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	71.4	59.7	62.2
Precipitation - Reference Evapotranspiration	-71.4	-59.7	-61.3
Number of Rainy Days	0.0	0.0	0.4
Number of Dry Days	38.0	36.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

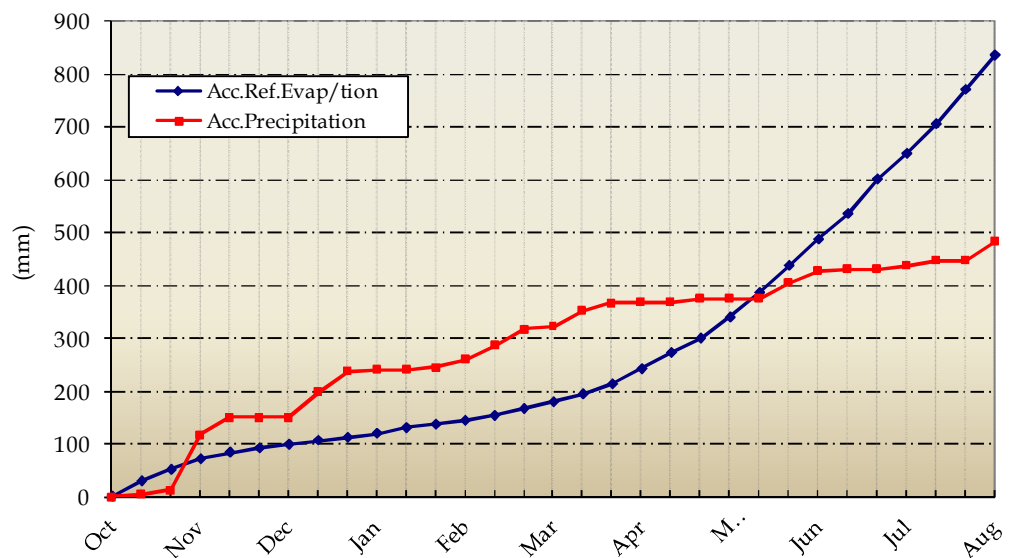


Larisa

3rd 10-day period (21-31/07/2010)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	35.2	34.6	37.2	40.0	34.0	28.2	31.2	31.6	32.0	32.8	33.6	33.7	34.7	33.2
	Min	21.2	21.4	21.0	22.2	22.2	20.8	18.2	17.0	16.2	16.6	18.2	19.5	19.5	18.1
Relative Humidity	Max	69	84	73	68	93	87	94	72	84	86	75	80	72	-
	Min	33	29	27	22	32	56	31	28	29	23	30	31	26	-
Soil Temperature at 10 cm	06 UTC	28.4	28.8	29.0	30.2	28.4	27.8	27.0	25.0	25.0	25.4	26.0	27.4	28.1	26.9
	12 UTC	31.8	32.0	32.4	34.2	33.2	27.4	28.8	28.0	29.2	29.0	29.2	30.5	30.3	29.2
Sunshine Duration		10.0	10.6	13.0	11.9	9.3	6.6	11.4	12.9	12.8	12.8	12.4	11.2	11.9	10.7
Precipitation						6.6	29.0						35.6		4.4
Evaporation		7.4	9.1	10.2	10.6	10.2	16.4	17.2	5.3	14.5	8.1	9.4	118.4	110.4	104.1
Growing Degrees	5	23.2	23.0	24.1	26.1	23.1	19.5	19.7	19.3	19.1	19.7	20.9	237.7	242.8	227.1
	10	18.2	18.0	19.1	21.1	18.1	14.5	14.7	14.3	14.1	14.7	15.9	182.7	187.8	172.1

3rd 10-day period (21-31/07/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	65.1	72.5	66.2
Precipitation - Reference Evapotranspiration	-29.5	-72.5	-61.8
Number of Rainy Days	2.0	0.0	1.1
Number of Dry Days	16.0	24.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

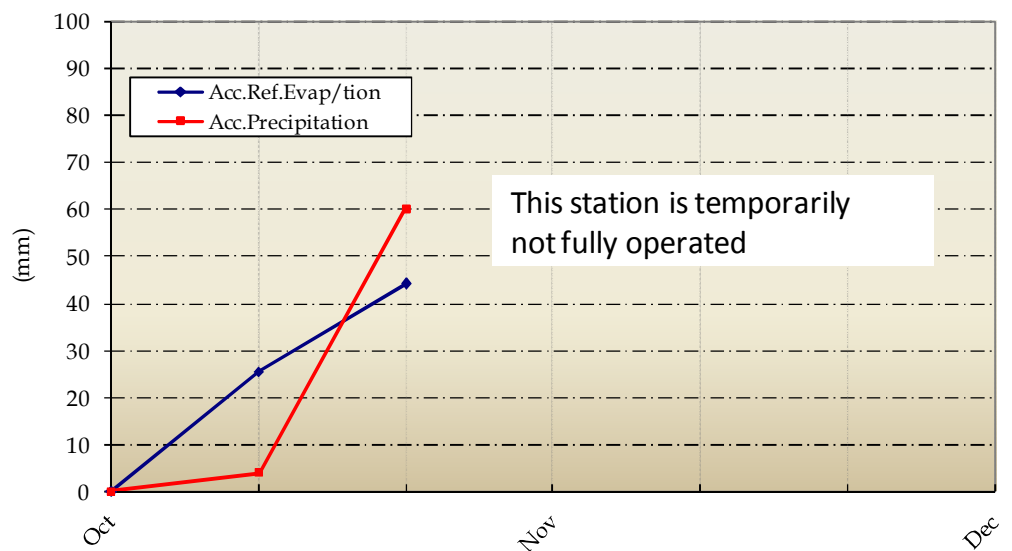


Pyrgela

3rd 10-day period (21-31/07/2010)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	-	-	-	-	-	-	-	-	-	-	-	35.7	34.1
	Min	-	-	19.8	19.2	-	15.0	15.0	14.6	16.0	16.0	17.2	16.6	18.4	16.8
Relative Humidity	Max	-	56	56	-	58	58	53	53	53	54	54	55	52	-
	Min	-	22	27	-	38	38	23	15	19	27	24	26	27	-
Soil Temperature at 10 cm	06 UTC	-	-	32.0	30.6	-	29.0	29.0	28.0	28.0	27.8	29.4	29.2	28.6	26.7
	12 UTC	-	-	38.0	38.0	-	38.4	37.4	36.4	37.2	37.2	38.2	37.6	36.2	35.2
Sunshine Duration		-	-	11.2	-	9.5	9.5	11.2	12.3	11.2	12.2	11.4	11.1	12.0	10.8
Precipitation		-	-	-	-	-	-	-	-	-	-	-	-	-	5.3
Evaporation		-	-	7.8	-	5.6	5.6	5.4	4.4	5.4	6.6	7.4	-	90.4	80.5
Growing Degrees	5	-	-	-	-	-	-	-	-	-	-	-	-	242.4	224.7
	10	-	-	-	-	-	-	-	-	-	-	-	-	187.4	169.7

3rd 10-day period (21-31/07/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	64.4	58.8
Precipitation - Reference Evapotranspiration	-	-64.4	-53.5
Number of Rainy Days	-	0.0	0.5
Number of Dry Days	-	25.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

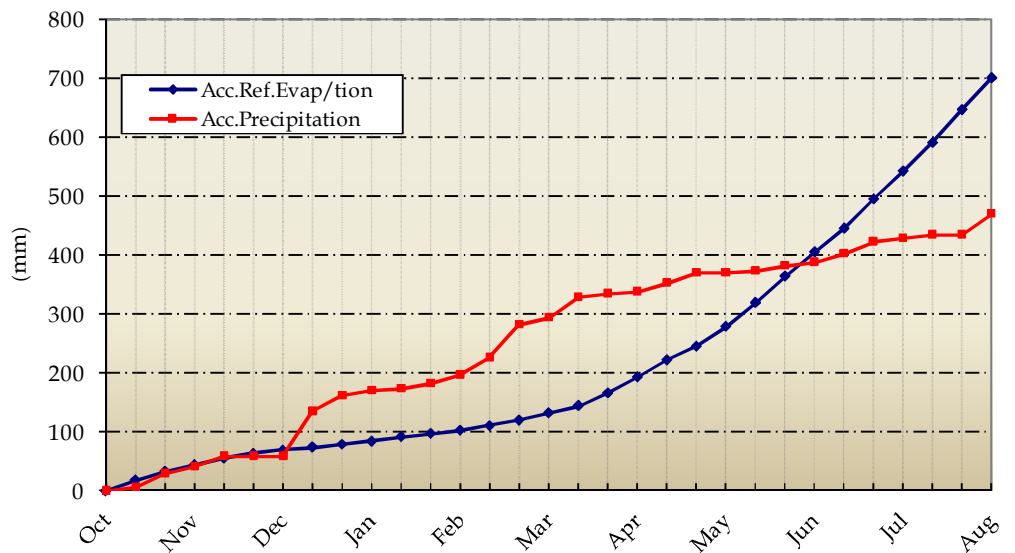


Series

3rd 10-day period (21-31/07/2010)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	36.4	34.6	37.8	37.0	33.0	25.6	31.6	30.6	32.8	33.4	34.0	33.3	35.7	32.6
	Min	20.0	22.4	22.4	21.8	19.6	20.4	18.8	15.8	16.4	17.0	18.0	19.3	20.8	18.8
Relative Humidity	Max	71	74	73	73	95	94	93	78	-	73	77	80	54	-
	Min	26	32	31	31	41	75	35	29	-	29	35	36	27	-
Soil Temperature at 10 cm	06 UTC	28.8	30.2	29.0	30.0	22.8	25.4	24.2	24.0	23.6	-	25.0	26.3	28.5	26.3
	12 UTC	30.6	30.6	30.2	31.4	28.0	25.2	28.6	26.0	26.0	27.2	27.4	28.3	30.2	29.4
Sunshine Duration		11.6	5.6	12.0	12.1	7.8	0.8	10.4	13.3	12.5	11.3	12.3	10.0	11.2	10.1
Precipitation						26.6	8.9						35.5		13.1
Evaporation		7.0	4.8	7.6	8.8	4.6	1.3	6.5	6.1	5.1	5.7	5.7	63.2	84.0	76.8
Growing Degrees	5	23.2	23.5	25.1	24.4	21.3	18.0	20.2	18.2	19.6	20.2	21.0	234.7	256.0	227.1
	10	18.2	18.5	20.1	19.4	16.3	13.0	15.2	13.2	14.6	15.2	16.0	179.7	201.0	172.3

3rd 10-day period (21-31/07/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	54.0	53.2	53.7
Precipitation - Reference Evapotranspiration	-18.5	-53.2	-40.6
Number of Rainy Days	2.0	0.0	2.1
Number of Dry Days	6.0	20.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

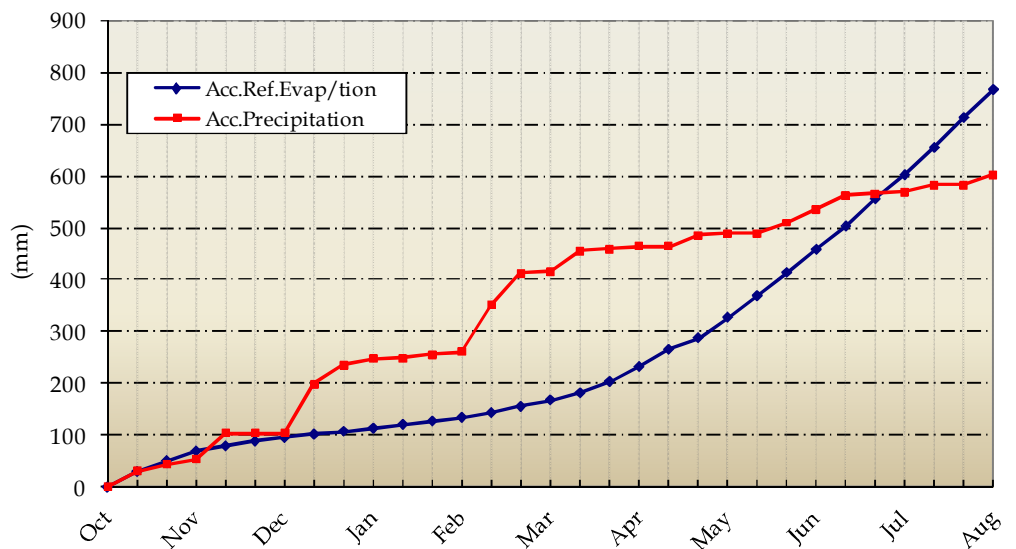


Trikala Imathias

3rd 10-day period (21-31/07/2010)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	35.0	31.6	36.4	36.4	32.2	25.2	28.4	30.6	30.8	31.6	31.4	31.8	33.9	31.7
	Min	21.4	21.4	21.4	20.6	19.6	17.8	17.0	15.8	15.8	17.4	18.8	18.8	19.5	18.3
Relative Humidity	Max	95	93	97	100	95	91	87	85	93	91	95	93	84	-
	Min	42	62	42	46	46	71	47	38	38	41	54	48	37	-
Soil Temperature at 10 cm	06 UTC	28.4	28.4	26.4	28.4	26.8	25.4	23.6	23.4	24.0	24.8	25.4	25.9	28.5	25.7
	12 UTC	31.6	28.0	30.0	31.4	29.4	26.2	26.2	25.6	28.4	29.2	29.4	28.7	32.4	27.3
Sunshine Duration		10.7	7.0	12.5	11.9	9.5	2.7	9.3	13.0	12.8	12.6	12.3	10.4	11.3	9.6
Precipitation			3.2			10.6	4.0	2.0					19.8		4.6
Evaporation		5.2	3.6	4.9	4.6	3.9	4.2	5.2	2.9	5.9	4.3	4.1	48.8	56.1	70.8
Growing Degrees	5	23.2	21.5	23.9	23.5	20.9	16.5	17.7	18.2	18.3	19.5	20.1	223.3	238.5	220.3
	10	18.2	16.5	18.9	18.5	15.9	11.5	12.7	13.2	13.3	14.5	15.1	168.3	183.5	165.3

3rd 10-day period (21-31/07/2010)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	54.2	64.9
Precipitation - Reference Evapotranspiration	-34.4	-64.9
Number of Rainy Days	4.0	0.0
Number of Dry Days	2.0	20.0

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

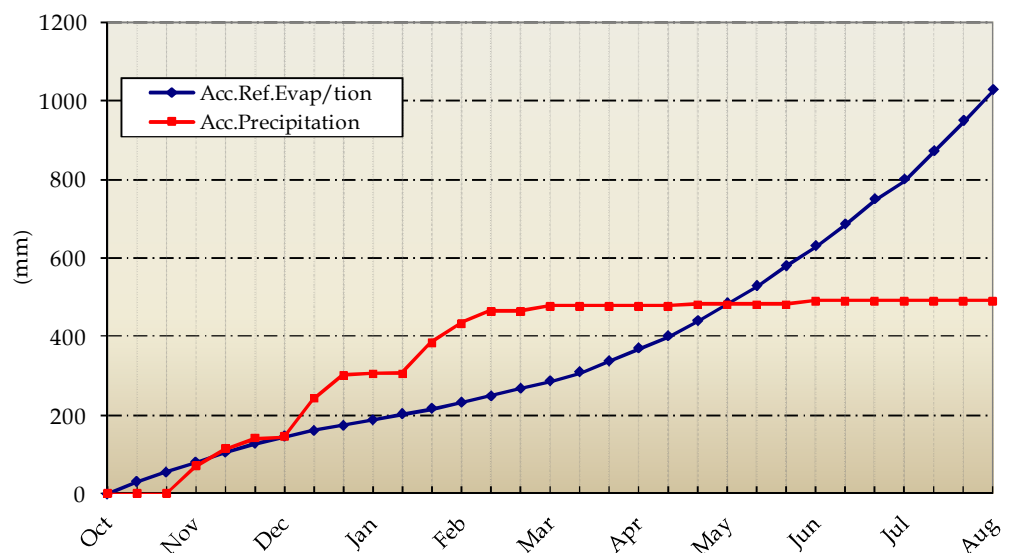


Tympaki

3rd 10-day period (21-31/07/2010)		21	22	23	24	25	26	27	28	29	20	31	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	36.0	34.6	35.0	37.6	32.4	28.2	28.0	33.8	32.0	33.0	30.0	32.8	33.3	31.8
	Min	23.6	22.2	22.0	23.0	22.4	22.6	21.2	20.6	19.0	20.0	21.0	21.6	22.3	20.7
Relative Humidity	Max	58	71	70	71	99	84	92	87	60	72	88	77	59	-
	Min	26	29	35	23	60	49	56	18	33	31	40	36	27	-
Soil Temperature at 10 cm	06 UTC	31.0	31.6	31.8	31.6	32.2	32.0	31.0	30.2	29.8	29.4	30.0	31.0	30.7	30.9
	12 UTC	34.2	36.4	36.0	37.0	37.2	36.6	36.2	35.6	34.4	35.2	35.6	35.9	35.7	35.3
Sunshine Duration		12.4	11.5	11.8	11.6	10.6	11.3	11.6	12.4	12.4	12.3	12.2	11.8	11.8	12.1
Precipitation															0.1
Evaporation		16.6	15.1	16.0	15.8	7.0	8.1	9.0	14.5	15.4	11.9	8.4	137.8	161.5	132.3
Growing Degrees	5	24.8	23.4	23.5	25.3	22.4	20.4	19.6	22.2	20.5	21.5	20.5	244.1	250.4	233.6
	10	19.8	18.4	18.5	20.3	17.4	15.4	14.6	17.2	15.5	16.5	15.5	189.1	195.4	178.6

3rd 10-day period (21-31/07/2010)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	78.4	83.1
Precipitation - Reference Evapotranspiration	-78.4	-83.1
Number of Rainy Days	0.0	0.0
Number of Dry Days	56.0	88.0

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration





◆ List of Symbols and Abbreviations

Reference Evapotranspiration E_{To} (mm):

Calculated by the FAO Penman-Montieth equation

$$E_{T_0} = \frac{0.408 * \Delta * (R_n - G) + \gamma * \frac{900}{T + 273} * u_2 * (e_s - e_a)}{\Delta + \gamma * (1 + 0.34 * u_2)}$$

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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El. Venizelou street 14, Zip Code 16777

Helliniko, Athens



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Issue Editors :

Charalabopoulos Christos

Filiou Anna

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