

# THE HASHEMITE KINGDOM OF JORDAN



## Jordan Meteorological Department



THIRD MEDARE WORKSHOP ON BUILDING MEDITERRANEAN LONG-TERM AND  
HOMOGENIZED CLIMATE DATASETS

ISTANBUL, TURKEY, 27-28 SEPTEMBER 2012  
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# JORDAN

- The total land area of Jordan is 90,000 square kilometers, which receives on the average an estimated 8.4 billion cubic meter of water.
- Most of the area (about 90%) receives less than 200 mm of annual rainfall.
- Jordan is a country with scarce water resources.
- The most important critical factor is low rainfall.

# CLIMATE IN JORDAN

- Jordan have Mediterranean type climate. It is similar to the climate found in California U.S.A, Southeast coast of Africa and Southeast coast of Australia.
- The climate of Jordan is marked by sharp seasonal variations in both temperature and precipitation. Hot dry summer and cool wet winter characterize it. Summer starts around mid-May and winter starts around mid-November, with two short transitional periods in between (autumn and spring).

# CLIMATE IN JORDAN

- The climate of Jordan could be divided into 4 main types according to the topography of the country, in spite of its small area:
  - Hilly Regions: cool dry summer and cold wet winter characterize the climate in these regions with good amount of rainfall.
  - The Ghor: very hot summer and warm winter characterize the climate in these regions with rainfall amount around 77-392 mm.
  - The Badia: very hot dry summer and cold winter characterize the climate in these regions with very little precipitation and clear sky during most of the year.
  - The Gulf of Aqaba: very hot summer and warm winter characterize the climate in this region with little amount of precipitation

# JMD BRIEF OUTLINE

- 1951 established as part of the Civil Aviation Authority
- Set up on 1967 as independent entity/MOT
- World Meteorological Organization member since 1955.
- Arab league member since 1955



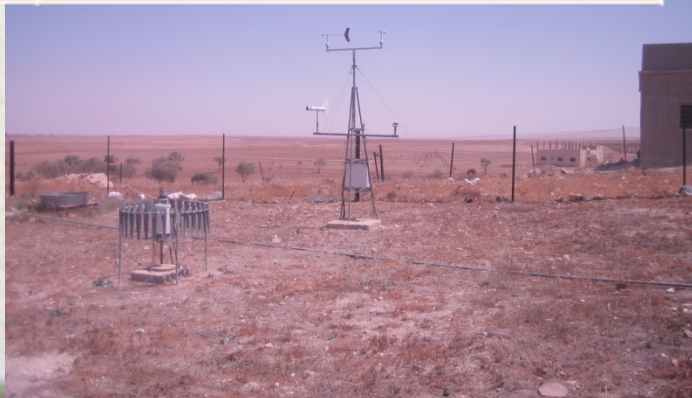
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**Jordan Meteorological Department (JMD)**

# Climate Data at JMD

Period	Meteorological Stations type
1923- present	Synoptic Stations
1970 - present	Agricultural Meteorological stations
1970- present	Climatological Stations
2005 - present	AWS
1964	Upper Air



# JMD Stations

- Synoptic Stations 15
- Agricultur stations 10
- Climate Stations 3
- AWS 9
- Upper Air 1

# Climate Data: history

- Earliest Data Record: 1923
- Various forms of paper log book
- Vax machine (mini computer) 1984
- PC IBM PCs – CLICOM 1990
- CDMS Oracle 2000
- Now JMD have 28 Million record



# **Type of weather observation data available**

(Temperature, precipitation, humidity, pressure ,wind  
sunshine hours, evaporation ,...)

# TYPE OF DATA AVAILABLE AT JMD

Station local Name	type of data	Period	Time step			form in which the data is presented	Description of quality control	Scanned Available			Digitized		
			daily	3H	6H			daily	3H	6H	daily	3 H	6H
<b>Baqura</b>	ALL	1967-2011	*	*	*	ALL	Manual and by JCDM system	*	*	*	*	*	*
<b>University Farm</b>	ALL	1983-2011	*		*	ALL	Manual and by JCDM system	*		*	*		*
<b>Deir Alla</b>	ALL	1953-2011	*	*	*	ALL	Manual and by JCDM system	*	*	*	*	*	*
<b>Ghor Safi</b>	ALL	1964-2011	*	*	*	ALL	Manual and by JCDM system	*	*	*	*	*	*
<b>Irbed</b>	ALL	1955-2011	*	*	*	ALL	Manual and by JCDM system	*	*	*	*	*	*
<b>Er Rabbah</b>	ALL	1955-2011	*	*	*	ALL	Manual and by JCDM system	*	*	*	*	*	*

# TYPE OF DATA AVAILABLE AT JMD

Station local Name	type of data	Period	Time step			form in which the data is presented	Description of quality control	Scanned Available			Digitized		
			daily	3H	6H			daily	3H	6H	daily	3 H	6H
Shoubak	ALL	1960-2011	*	*	*	ALL	Manual and by JCDM system	*	*	*	*	*	*
Wadi Dhulall	ALL	1967-2011	*	*	*	ALL	Manual and by JCDM system	*	*	*	*	*	*
Sama	ALL	2004-2011	*	*	*	ALL	Manual and by JCDM system	*	*	*	*	*	*
Wadi El-rayyan	ALL	1960-2011	*	*	*	ALL	Manual and by JCDM system	*	*	*	*	*	*
Swaileh	ALL	1985-2011	*		*	ALL	Manual and by JCDM system	*		*	*		*
Qatraneh	ALL	1983-2011	*	*	*	ALL	Manual and by JCDM system	*	*	*	*	*	*

# TYPE OF DATA AVAILABLE AT JMD

Station local Name	type of data	Period	Time step			form in which the data is presented	Description of quality control	Scanned Available			Digitized		
			daily	3H	6H			daily	3H	6H	daily	3 H	6H
Tafleeh	ALL	1973-2011	*	*	*	ALL	Manual and by JC DM system	*	*	*	*	*	*
Zarqa	ALL	2002-2011	*	*	*	ALL	Manual and by JC DM system	*	*	*	*	*	*
Ramtha	ALL	1976-2011	*	*	*	ALL	Manual and by JC DM system	*	*	*	*	*	*
Wadi Mousa	ALL	1984-2011	*		*	ALL	Manual and by JC DM system	*		*	*		*
Salt	ALL	1992-2011	*	*	*	ALL	Manual and by JC DM system	*	*	*	*	*	*
Aqaba	ALL	1956-2011	*	*	*	ALL	Manual and by JC DM system	*	*	*	*	*	*

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Station local Name	type of data	Period	Time step			form in which the data is presented	Description of quality control	Scanned Available			Digitized		
			daily	3H	6H			daily	3H	6H	daily	3 H	6H
<b>Ras Muneef</b>	ALL	1976-2011	*	*	*	ALL	Manual and by JCDM system	*	*	*	*	*	*
<b>Amman Airport</b>	ALL	1923-2011	*	*	*	ALL	Manual and by JCDM system	*	*	*	*	*	*
<b>Rwashed (H4)</b>	ALL	1960-2011	*	*	*	ALL	Manual and by JCDM system	*	*	*	*	*	*
<b>Mafraq</b>	ALL	1959-2011	*	*	*	ALL	Manual and by JCDM system	*	*	*	*	*	*
<b>Safawi (H5)</b>	ALL	1963-2011	*	*	*	ALL	Manual and by JCDM system	*	*	*	*	*	*
<b>Azraq South</b>	ALL	1980-2011	*	*	*	ALL	Manual and by JCDM system	*	*	*	*	*	*

# TYPE OF DATA AVAILABLE AT JMD

Station local Name	type of data	Period	Time step			form in which the data is presented	Description of quality control	Scanned Available			Digitized		
			daily	3H	6H			daily	3H	6H	daily	3 H	6H
<b>Q.A.I. Airport</b>	ALL	1970-2011	*	*	*	ALL	Manual and by JCDM system	*	*	*	*	*	*
<b>Ma'an</b>	ALL	1959-2011	*	*	*	ALL	Manual and by JCDM system	*	*	*	*	*	*
<b>Al Jafer</b>	ALL	1964-2011	*	*	*	ALL	Manual and by JCDM system	*	*	*	*	*	*
<b>Ghabawi</b>	ALL	2004-2011	*	*	*	ALL	Manual and by JCDM system	*	*	*	*	*	*

**stations observation period**

**&**

**missing data percentage**

# STATIONS OBSERVATION PERIOD AND MISSING DATA PERCENTAGE

Station Name	Missing Data				Period	Years with Temp.	Years with Prec.	Missing Percentage	
	Temperature		Precipitation					Temp.	Prec.
	Years	Month	Years	Month					
Baqura	1967	1,2,3,4	1967	1,2,3,4	40	37	37	7.50%	7.50%
	1969	12	1969	12					
	1970	1	1970	1					
Deir Alla	1952	1,2,3,4,5	1952	1,2,3,4,5	53	52	52	1.90%	1.90%
Ghor Safi					30	30	30	0%	0%
Irbed					50	50	50	0%	0%
Er Rabbah	1962	4,5,6,7,8,9,10	1965	11	44	39	43	11%	2.2%
	1963								
	1964	1,5,6,7							
	1965	6,10,11							
	1966	1,2,6,10							



# STATIONS OBSERVATION PERIOD AND MISSING DATA PERCENTAGE

Station Name	Missing Data				Period	Years with Temp.	Years with Prec.	Missing Percentage	
	Temperature		Precipitation					Temp.	Prec.
	Years	Month	Years	month					
Shoubak		1,2,3,4,5,6,7			45	41	45	8%	0%
	1960	2,3,4,5,6,7,8,9							
	1962	,10,11,12							
	1963	1,2,3,4,5,6,7,8							
	1964	,9,10,11,12							
	1,2,3,4,5,6,7,8								
	,9,10								
Wadi Dhulall					37	37	37	0%	0%
Wadi El-rayyan			1970	10,11	44	43	42	2.2%	4.5%
	1971	5	1971	1/5					
Swaileh	1985	6,7			20	18	24	10%	0%
	2004	5	2004	5					

# STATIONS OBSERVATION PERIOD AND MISSING DATA PERCENTAGE

Station Name	Missing Data				Period	Years with Temp.	Years with Prec.	Missing Percentage	
	Temperature		Precipitation					Temp.	Prec.
	Years	Month	Years	month					
Alhasa/Tafileh	1993	11	1999	3,9	32	30	31	6%	3%
	1999	3							
Qatraneh					21	21	21	0.0%	0%
Roman Ampt.Amman	1999	1	1999	1	31	28	28	9%	9%
	2002	2	2002	2					
	2003	9	2003	9					
Madaba	1969	1,2,3,4,5,6,7,8		35	32	35	8%	0%	
	1976	1,2,3,4							
	1999	8							

# STATIONS OBSERVATION PERIOD AND MISSING DATA PERCENTAGE

Station Name	Missing Data				Period	Years with Temp.	Years with Prec.	Missing Percentage	
	Temperature		Precipitation					Temp.	Prec.
	Years	Month	Years	month					
Wadi Mousa	1984	1,2,3,4,8,9			21	14	21	33%	23%
	1985	5	1993	2					
	1993	2	1994	2,3,4,5,6					
	1994	2,3,4	1995	6,12					
	1995	8,12	1998	5,6,9,10,11,12					
	1998	6,7,8,9,10,11,12	1999	1,2,3,4,5,6,7,8					
	1999	1,2,3,4,5,6,7,8							
Salt	1991	1,2,3,4,5,6,7,8,9,10,11	1985 1986,1987,1988,1989,1990,1991	10,11,12 1,2,3,4,5,6,7,8,9,10,11,12	13	11	8	15%	61%
	2002	5	2002	5					
Aqaba					46	46	59	0.0%	0%

# STATIONS OBSERVATION PERIOD AND MISSING DATA PERCENTAGE

Station Name	Missing Data				Period	Years with Temp.	Years with Prec.	Missing Percentage	
	Temperature		Precipitation					Temp.	Prec.
	Years	Month	Years	month					
Ras Muneef	1976	1,2,3,4,5,6,7			28	27	0	3.5%	0%
Amman Airport					82	82	82	0.0%	0%
Rwaished (H4)					44	44	44	0.0%	0%
Mafraq	1953	1,2 8,9,10,11,12			52	47	52	10%	0%
	1956	1,2,3,4,5,6,7,8 ,9,10,11,12							
	1957	1,2,3,4,5,6,7,8 ,9,10,11,12							
	1958	1,2,3,4,5,6,7,8 ,9,10,11,12							
	1959	1,2,3,4,5,6							
Safawi (H5)					41	41	41	0%	0%

# STATIONS OBSERVATION PERIOD AND MISSING DATA PERCENTAGE

Station Name	Missing Data				Period	Years with Temp.	Years with Prec.	Missing Percentage	
	Temperature		Precipitation					Temp.	Prec.
	Years	Month	Years	month					
Azraq South	1980	1,2,3,4,5,6,7,8 ,9,10			24	23	24	4%	0.0%
Q.A.I.Airport	1970	1,2,3,9			34	33	34	3%	0%
Ma'an	2003	5			45	43	44	4.5%	2.5%
	2005	1,2,3,4,5,6,7,8 ,9,10,11,12 ,9,10,11,12	2003	5					
Al Jafer	1976	1,2,3,4,5,6,7,8 ,9,10,11,12			40	35	40	12.5%	0%
	1977	1,2,3,4,5,6,7,8 ,9,10,11,12							
	1978	1,2,3,4,5,6,7,8 ,9,10,11,12							
	1979	1,2,3,4,5,6,7,8 ,9,10,11,12							
	1980	1,2,3,4,5,6,7,8 ,9,10,11,12							
		1,2,3,4,5,6,7,8 ,9,10,11,12							

**Station Identifiers  
&  
Geographical Details**

## Station Location

<b>Station local Name</b>	<b>WMO #</b>	<b>Lon</b>	<b>Lat</b>	<b>Elevation</b>
<b>Baqura</b>	40253	35°37'	32°40'	-170
<b>University Farm</b>		35°37'	32°10'	-230
<b>Deir Alla</b>	40285	35°37'	32°13'	-224
<b>Ghor Safi</b>	40296	35°29'35"	31°3'32"	-380
<b>Irbed</b>	40255	35°51'18"	32°32'04"	616
<b>Er Rabbah</b>	40292	35°44'19"	31°16'32"	942
<b>Shoubak</b>	40300	35°31'50"	30°30'38"	1365

## Station Location

<b>Station local Name</b>	<b>WMO #</b>	<b>Lon</b>	<b>Lat</b>	<b>Elevation</b>
<b>Wadi Dhulall</b>	40267	36°17'40"	32°9'59"	580
<b>Sama</b>		35°41'28"	32°33'54"	332
<b>Wadi El-rayyan</b>	40256	35°35'	32°24'	-200
<b>Swaileh</b>	40269	35°54'48"	32°1'29"	1086
<b>Qatraneh</b>	40275	36°2'48"	31°14'57"	768
<b>Tafleleh</b>	40298	35°37'37"	30°50'51"	1258
<b>Zarqa</b>	40273	36°4'59"	32°5'04"	644



## Station Location

Station local Name	WMO #	Lon	Lat	Elevation
<b>Ramtha</b>	40252	35°58'37"	32°29'43"	590
<b>Wadi Mousa</b>	40313	35°28'14"	30°19'03"	1115
<b>Salt</b>	40268	35°44'38"	32°2'26"	935
<b>Aqaba</b>	40340	35°1'07"	29°36'15"	55
<b>Ras Muneef</b>	40257	35°48'41"	32°22'49"	1150
<b>Amman Airport</b>	40270	35°59'06"	31°58'5"	780
<b>Rwaished (H4)</b>	40250	38°11'41"	32°30'15"	683

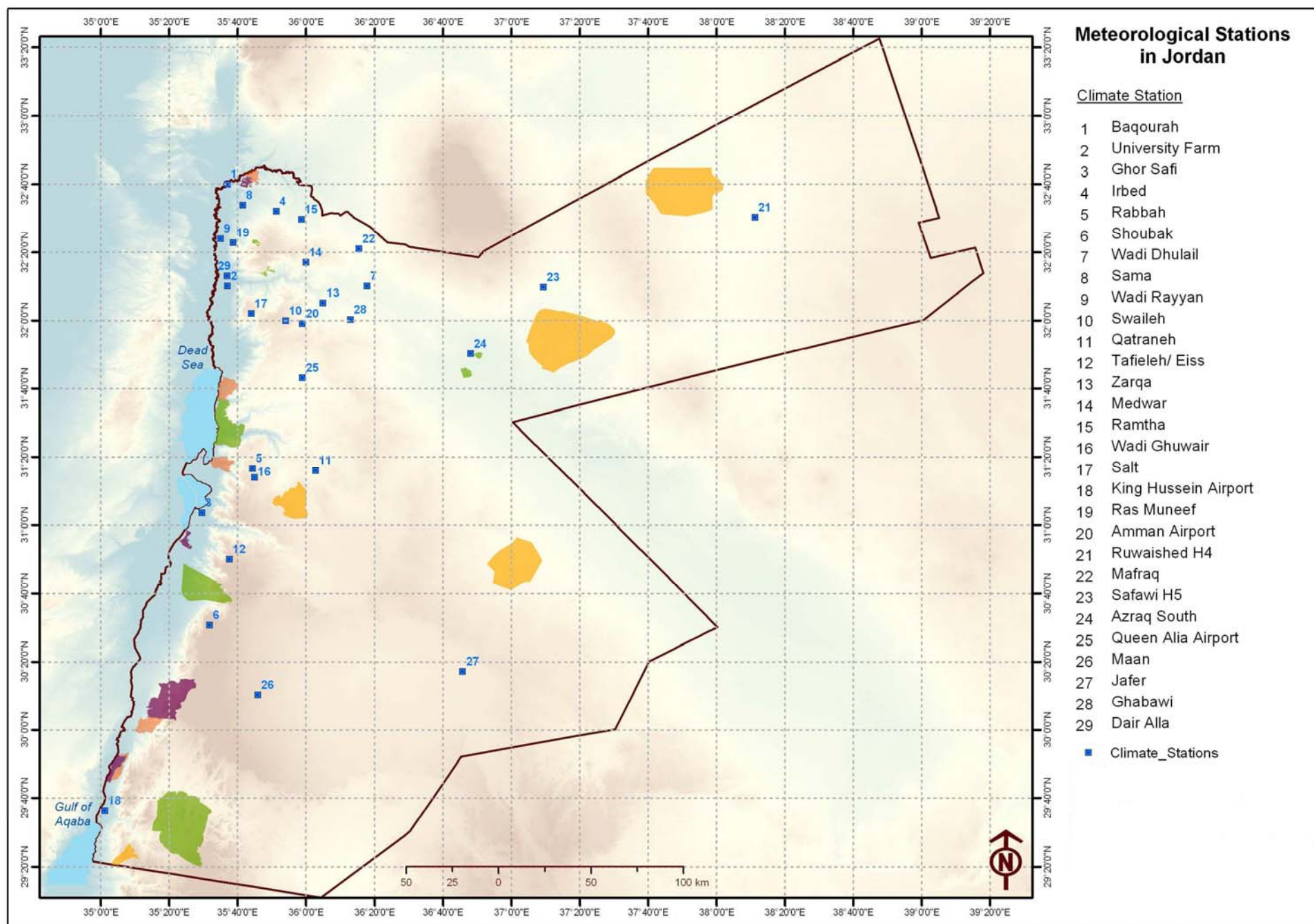
## Station Location

Station local Name	WMO #	Lon	Lat	Elevation
<b>Mafrq</b>	40265	36°15'22"	32°21'06"	686
<b>Safawi (H5)</b>	40260	37°9'18"	32°09'39"	674
<b>Azraq South</b>	40288	36°47'59"	31°50'16"	521
<b>Q.A.I.Airport</b>	40272	35°59'	31°43'	722
<b>Ma'an</b>	40310	35°45'54"	30°10'14"	1069
<b>Al Jafer</b>	40305	36°9'	30°17'	865
<b>Ghabawi</b>	40244	36°12'56"	32°00'10"	725

# Meteorological Stations in Jordan

## Climate Station

- 1 Baqourah
  - 2 University Farm
  - 3 Ghor Safi
  - 4 Irbed
  - 5 Rabbah
  - 6 Shoubak
  - 7 Wadi Dhulail
  - 8 Sama
  - 9 Wadi Rayyan
  - 10 Swaileh
  - 11 Qatraneh
  - 12 Tafieleh/ Eiss
  - 13 Zarqa
  - 14 Medwar
  - 15 Ramtha
  - 16 Wadi Ghuwair
  - 17 Salt
  - 18 King Hussein Airport
  - 19 Ras Muneef
  - 20 Amman Airport
  - 21 Ruwashed H4
  - 22 Mafrq
  - 23 Safawi H5
  - 24 Azraq South
  - 25 Queen Alia Airport
  - 26 Maan
  - 27 Jafer
  - 28 Ghabawi
  - 29 Dair Alla
- Climate\_Stations



*Thank you to be Patient*