



AGRICULTURAL METEOROLOGY IN TURKEY

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RESEARCH DEPARTMENT
Agricultural Meteorology Division**

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AGRICULTURAL METEOROLOGY



Studies in Agricultural Meteorology Division

- **Agricultural Forecast and Warnings**
- **Drought Monitoring**
- **Forecasting of Harvest Date**
- **Frost Forecast and Warnings (ZDUS)**
- **Crop Monitoring and Yield Forecasting**
- **Irrigation Planner System (SUBİS)**
- **Normal Maps of Grass Reference ETo**
- **Phenological Observations**
- **Heat and Hardiness Zone**
- **Agrometeorological Bulletin**



AGRICULTURAL FORECAST AND WARNINGS



Usage Areas of Agricultural Forecast

1. Sowing - Planting
2. Agricultural protection against diseases and pests
3. Drying
4. Stocking, Storage and Transport
5. Frost and Preventing Its Harms
6. Forest Fires
7. Irrigation
8. Agricultural Aviation



AGRICULTURAL FORECAST AND WARNINGS

Map of Nine (9) Agricultural Regions





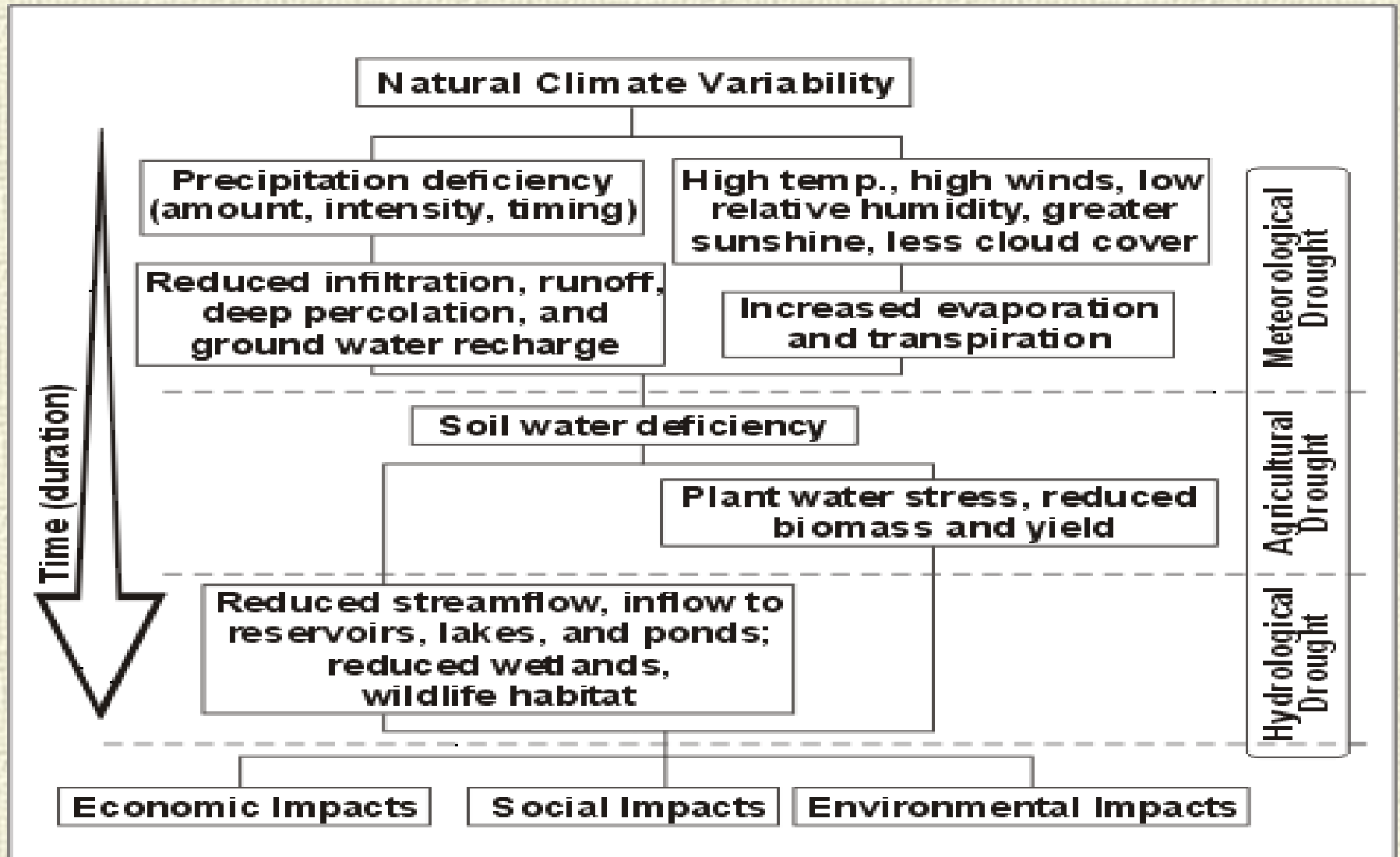
AGRICULTURAL FORECAST AND WARNINGS



- Forecast which is produced by “Analysis and Numerical Forecast Division” helps to us in preparing 5-Days Forecast.
- The products of that division are weekly map and reports, Kalman temperature analysis, Meteograms, wind maps and MM5 maps.
- Long term normal and extreme values are used in order to realize comparative analysis.

DROUGHT ANALYSIS

Types and Impacts of Drought



DROUGHT ANALYSIS

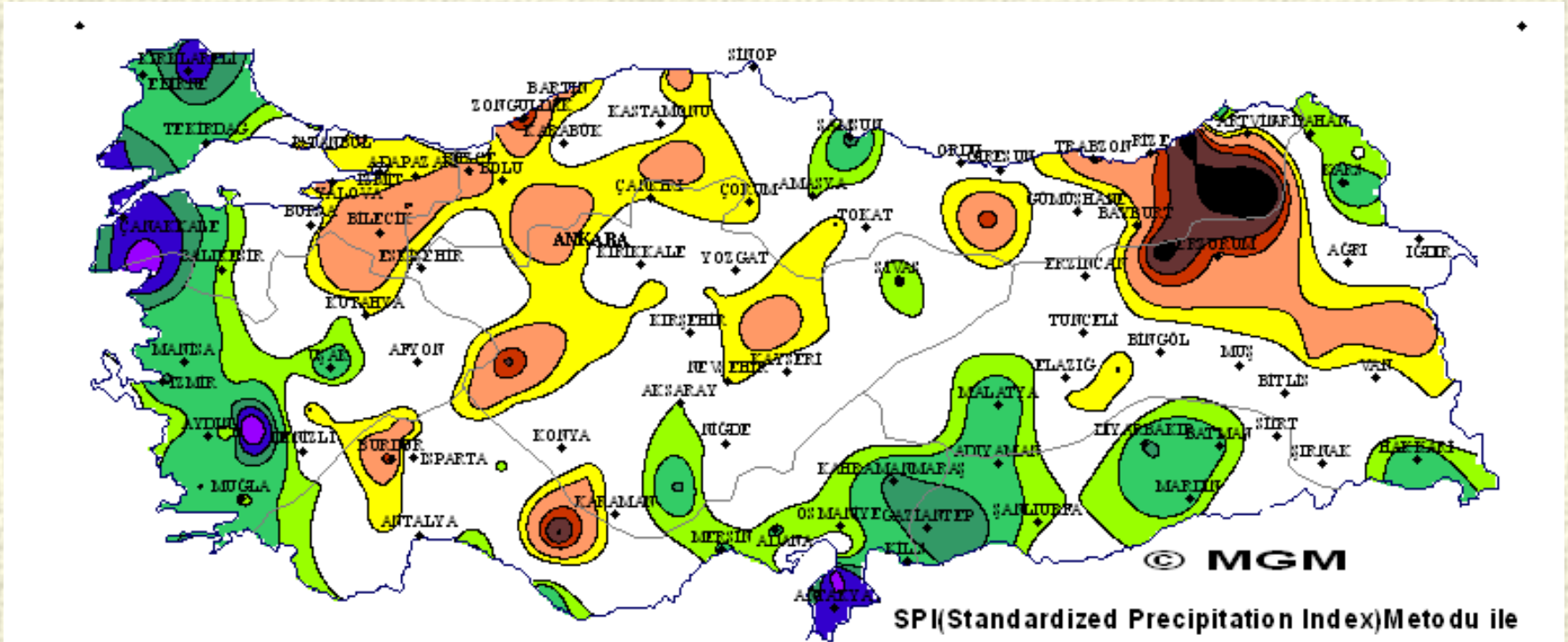
Standardized Precipitation Index (SPI)

It is a drought index which can consider variance of precipitation shortage in different time periods (1, 3, 6, 9, 12, 24, and 48 months). Monthly precipitation arrays for at least 30 years are prepared, and SPI values are normalized. Then, dry and humid periods are determined for desired time period.

SPI İNDİS DEĞERLERİ	SINIFLANDIRMA	CLASSIFICATION
2.0 ve fazla	Olağanüstü Nemli	Exceptionally Moist
1.60 ile 1.99	Aşırı Nemli	Extremely Moist
1.30 ile 1.59	Çok Nemli	Very Moist
0.80 ile 1.29	Orta Nemli	Moderately Moist
0.51 ile 0.79	Hafif Nemli	Abnormally Moist
0.50 ile -0.50	Normal Civarı	Near Normal
-0.51 ile -0.79	Hafif Kurak	Abnormally Dry
-0.80 ile -1.29	Orta Kurak	Moderately Dry
-1.30 ile -1.59	Şiddetli Kurak	Severely Dry
-1.60 ile -1.99	Çok Şiddetli Kurak	Extremely Dry
-2.0 ve düşük	Olağanüstü Kurak	Exceptionally Dry

DROUGHT ANALYSIS

2012 October - 2013 September (12 Months)
Drought Map According to SPI



SPI(Standardized Precipitation Index)Metodu ile
Meteorolojik Kuraklık Haritası
12 Aylık (Ekim 2012-Eylül 2013)
Hazırlanış Tarihi: Ekim 2013

* Bu veriler kalite kontrolden geçmiştir.



DROUGHT ANALYSIS

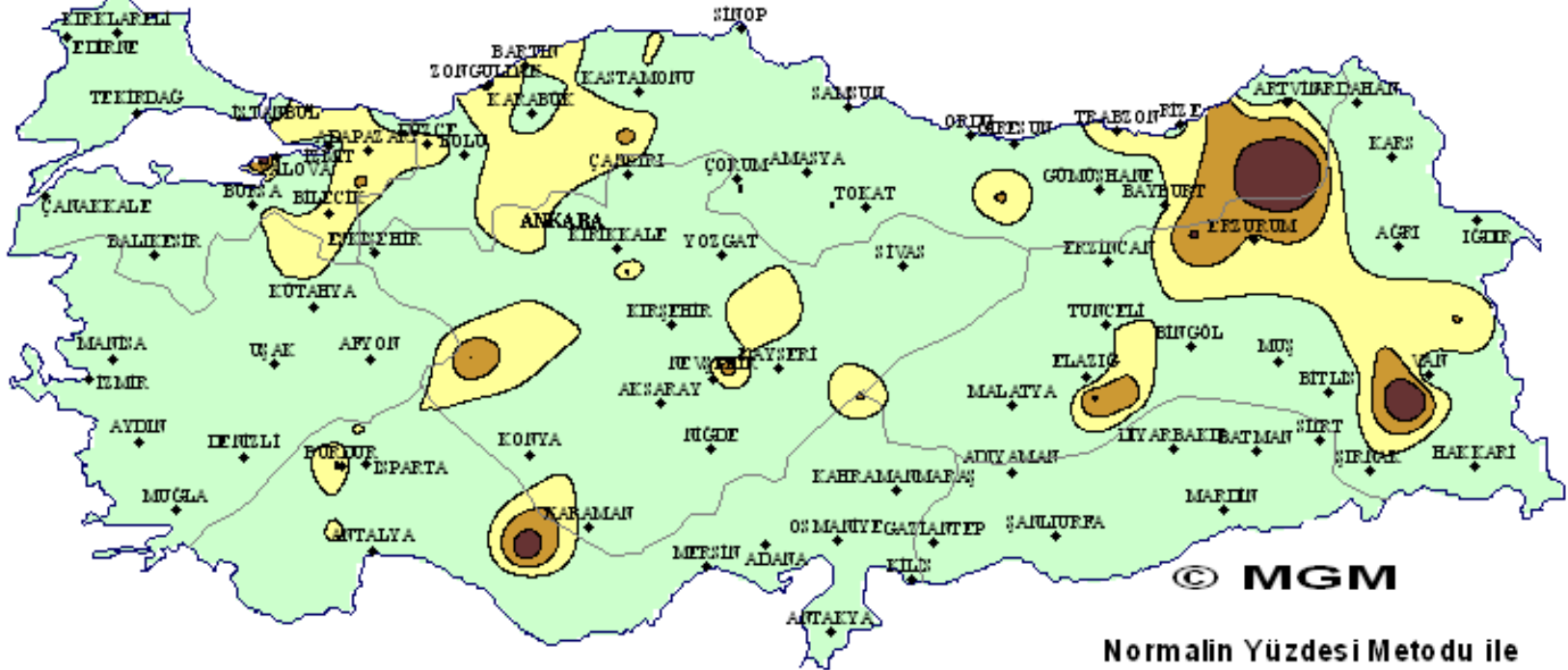
Percent of Normal Index (PNI)

It is the most simple drought index. It is calculated this way: actual precipitation divided by normal precipitation and multiplied by 100 for a certain time period. Precipitation shortage in different time periods (monthly or yearly) can be calculated.

Number of Months Analyzed	Normal (% of Normal Precipitation)	Watch (% of Normal Precipitation)	Warning (% of Normal Precipitation)	Emergency (% of Normal Precipitation)
1	>75.0	75.0	65.0	55.0
3	>75.0	75.0	65.0	55.0
6	>80.0	80.0	70.0	60.0
9	>83.5	83.5	73.5	63.5
12	>85.0	85.0	75.0	65.0

DROUGHT ANALYSIS

2012 October-2013 September (12 Months)
Drought Map According to PNI



Normalin Yüzdesi Metodu ile
Kuraklık Haritası
(Percent of Normal)

12 Aylık (Ekim 2012-Eylül 2013)

Hazırlanış Tarihi: Ekim 2013

* Bu veriler kalite kontrolden geçmemiştir.

NORMAL VE ÜSTÜ (Risk Yok)	HAFIF KURAK (İzleneye Başlı)	ORTA ŞİDDETE KURAK (Uyarı)	ŞİDDETLİ KURAK (Acil Durum)
% 85	% 75	% 65	

DROUGHT ANALYSIS

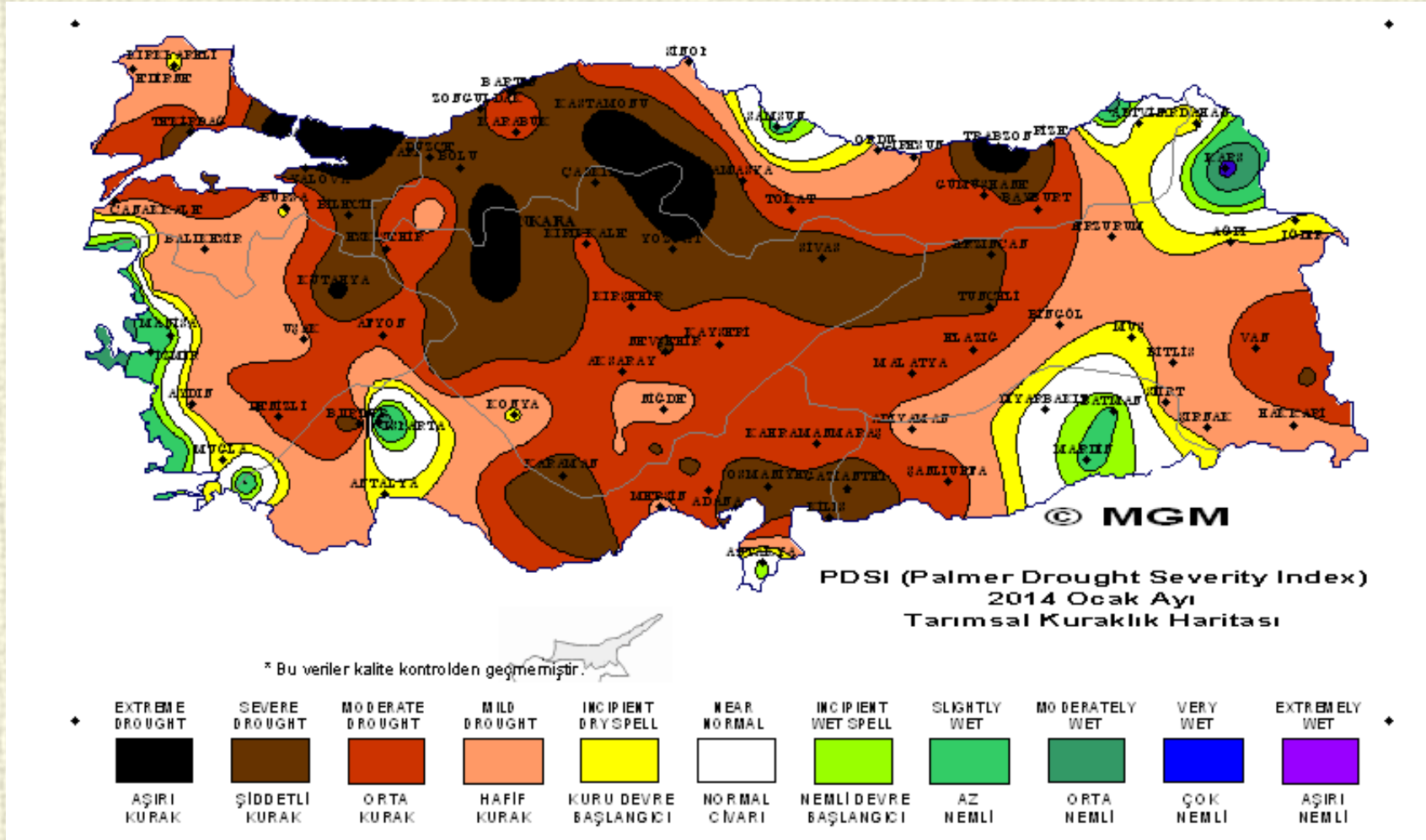
Palmer Drought Severity Index (PDSI)

A measurement of dryness based on recent precipitation and temperature. It is based on a supply-and-demand model of soil moisture. Supply is comparatively straightforward to calculate, but demand is more complicated as it depends on many factors - not just temperature and the amount of moisture in the soil but hard-to-calibrate factors including evapotranspiration and recharge rates.

	CLASSIFICATION	SINIFLANDIRMA
4 veya daha fazla	Extremely Wet	Aşırı Nemli
3.00 - 3.99	Very Wet	Çok Nemli
2.00 - 2.99	Moderately Wet	Orta Nemli
1.00 - 1.99	Slightly Wet	Az Nemli
0.50 - 0.99	Incipient Wet Spell	Nemli Devre Başlangıcı
0.49 - -0.49	Near Normal	Normal Civarı
-0.50 - -0.99	Incipient Dry Spell	Kuru Devre Başlangıcı
-1.00 - -1.99	Mild Drought	Hafif Kurak
-2.00 - -2.99	Moderate Drought	Orta Kurak
-3.00 - -3.99	Severe Drought	Şiddetli Kurak
-4.00 veya daha az	Extreme Drought	Aşırı Kurak

DROUGHT ANALYSIS

2014 January Drought Map According to PALMER



DROUGHT ANALYSIS

Drought Monitoring System (KIS 2.1)

- Drought Monitoring System (SPS 2.1) is a software created with the purpose of drought monitoring on a monthly basis. Standardized Precipitation Index (SPI) is used in order to monitor the drought .
- System shows long term drought of the station (Max. 65 years). You can choose any period of the year for different durations (3 , 6 , 9 , 12 and 24 months). It calculates the drought value of the selected period of the years.
- The bars which under the horizontal axis indicates dry seasons , and the bars which above the horizontal axis indicates the wet periods. Meanings of the colours are shown at the right side of the page.
- The driest year, number of the dry years, the status of the last year and other informations are given by the system.



DROUGHT ANALYSIS



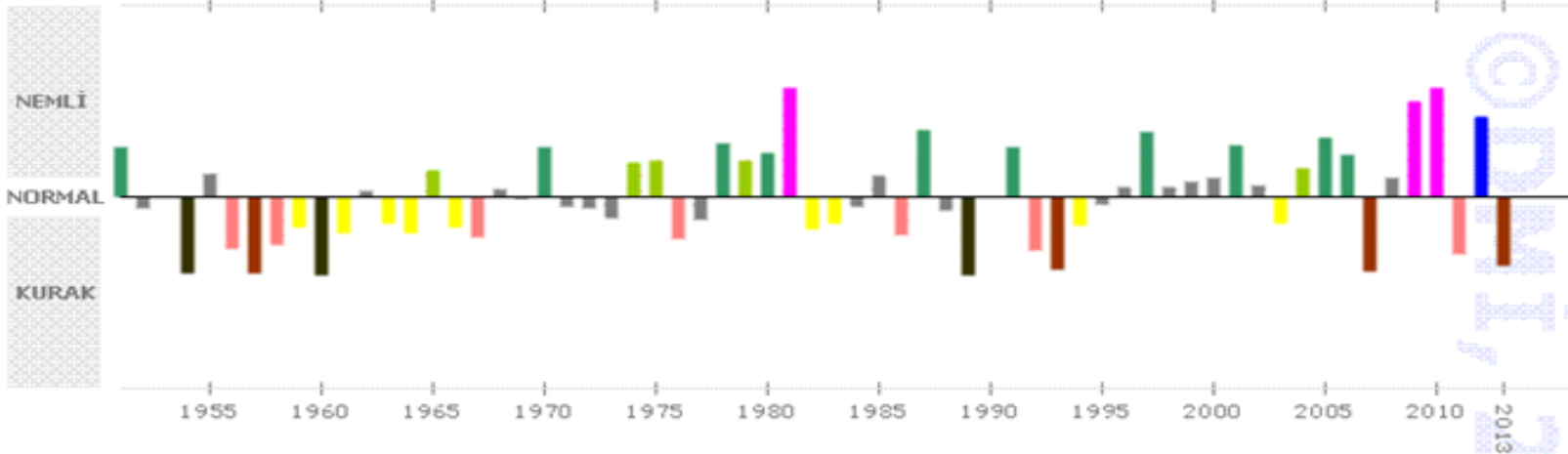
12 months drought analysis of İstanbul (1951-2013)

Kuraklık İzleme Sistemi 2.1

Merkez: Dönem: Son Ay:

[Tüm dönemleri görmek için tıklayınız.](#)

İSTANBUL / SARIYER KURAKLIK ANALİZİ



SEÇİLEN DÖNEM (Başlangıç ve Bitiş Tarihi) : 12 AYLIK (2013 OCAK - 2013 ARALIK)
2013 ARALIK YAĞIŞI : 80 mm.

SEÇİLEN DÖNEM - 12 AYLIK- KURAKLIK DURUMU : ŞİDDETLİ KURAK
ÖNCEKİ YIL AYNI DÖNEMİN KURAKLIK DURUMU : AŞIRI NEMLİ
SON 10 YIL İÇİNDE KURAK GEÇEN YIL SAYISI : 3

EN KURAK 12 AYLIK DÖNEM : 1989 - ÇOK ŞİDDETLİ KURAK
İLK GÖZLEM YILI : 1951
ANALİZİ YAPILAN TOPLAM YIL SAYISI : 62
KURAK GEÇEN YIL SAYISI : 23

RENKLERİN AÇIKLAMALARI

- Olağanüstü Nemli
- Aşırı Nemli
- Çok Nemli
- Orta Nemli
- Hafif Nemli
- Normal Civarı
- Hafif Kurak
- Orta Derece Kurak
- Şiddetli Kurak
- Çok Şiddetli Kurak
- Olağanüstü Kurak



AGRICULTURAL DROUGHT COMBATING STRATEGY AND ACTION PLAN



T.C.
TARIM VE KÖYİŞLERİ BAKANLIĞI

TÜRKİYE
TARIMSAL KURAKLIKLA MÜCADELE
STRATEJİSİ VE EYLEM PLANI
(2008-2012)



T.C.
GIDA, TARIM VE HAYVANCILIK BAKANLIĞI
TÜRKİYE TARIMSAL KURAKLIKLA
MÜCADELE STRATEJİSİ VE EYLEM PLANI
(2013-2017)





AGRICULTURAL DROUGHT COMBATING STRATEGY AND ACTION PLAN

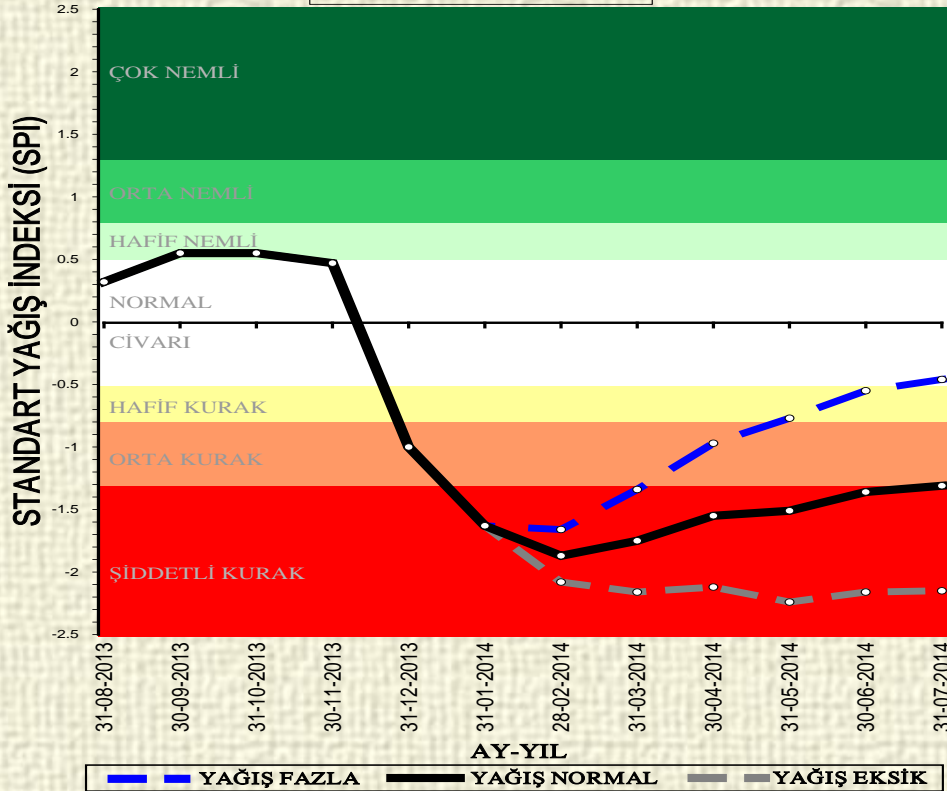
Main Strategy to Combat Agricultural Drought;

- **To improve an institutional structure having sufficient capacity,**
- **To realize combat under an integrated and comprehensive plan,**
- **To establish a structure for agricultural sector to ensure it to be least affected by drought.**
- **Under Agricultural Drought Combating Strategy and Action Plan;**
- **Monitoring, Early Warning and Estimation Committee,**
- **Risk Assessment Committee,**
- **Data Flow Unit has been established at Central Authority.**
- **Also Agricultural Drought Provincial Crisis Centers have been established in each province.**

AGRICULTURAL DROUGHT COMBATING STRATEGY AND ACTION PLAN

Drought risk assesment for future 6 months by using SPI and ECMWF seasonal forecast

TÜRKİYE GENEL
(12 AY)

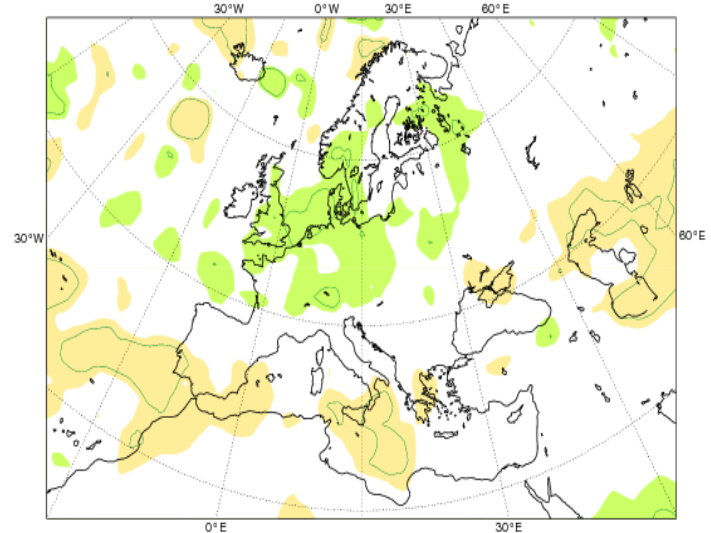


ECMWF Seasonal Forecast
Mean precipitation anomaly
Forecast start reference is 01/02/14
Ensemble size = 51, climate size = 450

System 4
MAM 2014
Shaded areas significant at 10% level
Solid contour at 1% level

Legend for precipitation anomaly (mm):

- <-200mm
- 200..-100
- 100..-50
- 50..0
- No Signal
- 0..50
- 50..100
- 100..200
- >200mm





Definition

- **Gathering total temperature whom crops require to complete standard grow and development in a life time, forecasting of harvest date by the aid of this temperature value,**
- **Can be used to calculate the vegetative period required to be able to determine suitable sowing regions of crops in our country.**
- **For the purpose, “Forecasting of Harvest Date” program is developed and is presented to the related people on the institutional webpage.**



FORECASTING OF HARVEST DATE



Forecasting of Harvest Date Program



HASAT ZAMANI TAHMİNİ

ETKİLİ SICAKLIK TOPLAMI---BÜYÜME DERECE-GÜN
(Growing Degree-Day)

Sonuçlar

İl - İlçe	ANKARA - POLATLI
Denizden Yükseklik	886m
Bitki Türü - Çeşiti	Bugday - Kışlık(Taban:3°C,Tavan:30°C)
Toplam Sıcaklık İsteği	2000°C
Gerçekleşen Toplam Sıcaklık	479°C
Kalan Toplam Sıcaklık	1526°C
Gerçekleşen Vejetasyon Süresi	140 Gün
Kalan Vejetasyon Süresi	149 Gün
Toplam Vejetasyon Süresi	289 Gün
Başlangıç/Ekim Tarihi	01.10.2013
Bitiş/Hasat Tarihi	17.7.2014

Seçtiğiniz Bugday bitkisi için tahmini hasat zamanı başlangıcı 17 Temmuz 2014 tarihidir.

[< Ana Sayfaya Dön](#)

Bilgi / Öneri : arastirmaweb@mgn.gov.tr

Araştırma Dairesi Başkanlığı
2012



FROST EARLY WARNING SYSTEM



- **Studies of frost warnings start with early fall frosts and end with late spring frosts.**
- **Risk maps of agricultural frost for 4-days are prepared and published on institutional website everyday.**
- **To this end, “Frost Early Warning System” program is developed and presented on the institutional webpage for the people whom concern.**



FROST EARLY WARNING SYSTEM



Frost Early Warning System

Zirai Don Uyarı Sistemi (zous 2.0)

il: ERZINCAN

İlçe: _MERKEZ_

Bitki: BADEM

Safha: ÇİÇEKLENME

Kritik Sıcaklık: -1

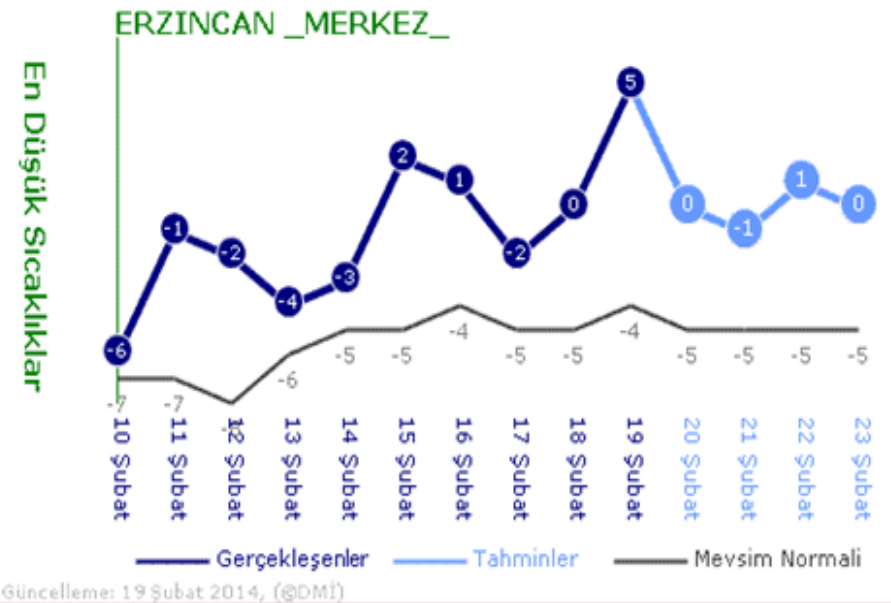
Zirai Don Risk Durumu (Beklenen En Düşük Sıcaklıklar)

20 Şubat	21 Şubat	22 Şubat	23 Şubat
0°C	-1°C	1°C	0°C

Renklerin Anlamları

	Bitki ve Safha Seçilmedi
	Don Riski Yok
	Don Riski Var

Bilgi ve Öneri İçin:
arastirmaweb@mqm.gov.tr
Ankara 2011



[Dondan Korunma Yöntemleri İçin Tıklayınız.](#)

Önemli Not

1. Tahmin edilen minimum sıcaklıklar 2 metre yükseklikte, kapalı siper içindeki sıcaklıklardır. Açık toprak üzerinde ölçülen minimum sıcaklıklar daha düşük olarak gerçekleşmektedir.
2. Tahminler meteoroloji istasyonu bulunan yerler için yapılmaktadır. İstasyon ağımlık genişledikçe diğer ilçeler de sisteme dahil edilecektir.
3. Bitkiler için verilen kritik sıcaklıklar BM, Gıda ve Tarım Örgütü (FAO) ile Türkiye'de yapılan araştırma sonuçlarından alınmıştır. Bu değerler bitki tür ve çeşidine göre değişmektedir.
4. Sıcaklıklar, arazinin yüksekliğine, yönüne, eğimine, rüzgardan etkilenme duruma göre önemli değişiklikler gösterdiğinden, üreticilerimizin arazilerindeki sıcaklığı termometre ile takip etmeleri tavsiye olunur.



FROST EARLY WARNING SYSTEM

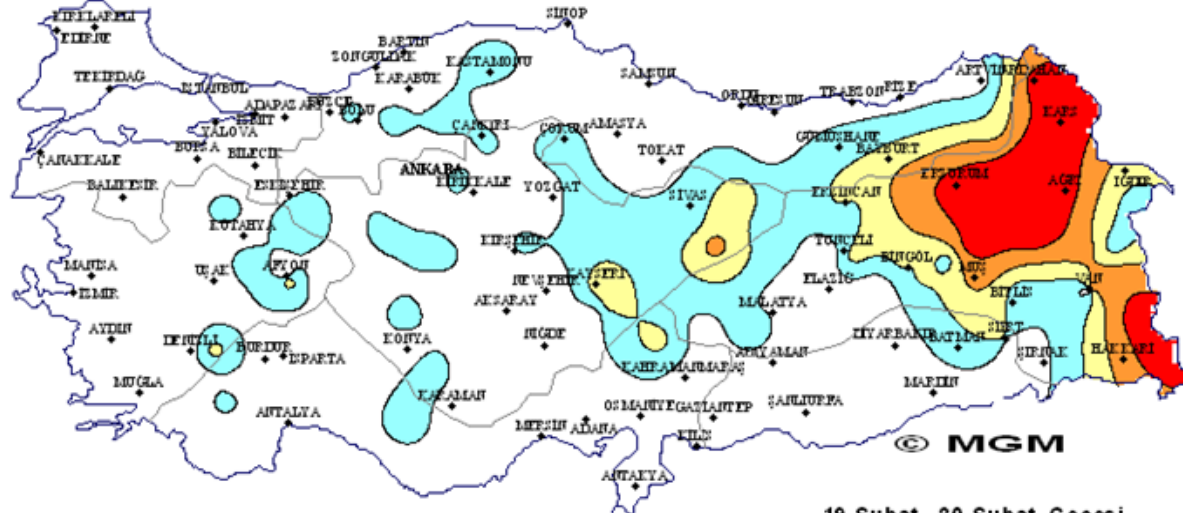
Frost Risk Maps (4 Days)

Zirai Don Uyarı Sistemi

Zirai Don Uyarı Sistemi | 4 Günlük Zirai Don Risk Tahmin Haritaları | Türkiye Don Takvimi

Don Olayından Korunma Yöntemleri | Zirai Don Hadisinde Kritik Saatler | Don Tahmini Açıklaması

4 Günlük Zirai Don Risk Tahmin Haritaları / 2 m.



© MGM

19 Şubat - 20 Şubat Gecesi
İçin Don Risk Haritası
Hazırlanış Tarihi : 19 Şubat 2014

* Bu tahminler sayısal model ürünlerinden elde edilmiştir.

* Verilerin düzenlenmesi ve yayını Araştırma Dairesi Başkanlığı tarafından yapılmaktadır.

DON RİSKİ YOK	HAFİF KUVVETTE DON RİSKİ	ORTA KUVVETTE DON RİSKİ	KUVVETLİ DON RİSKİ	ÇOK KUVVETLİ DON RİSKİ
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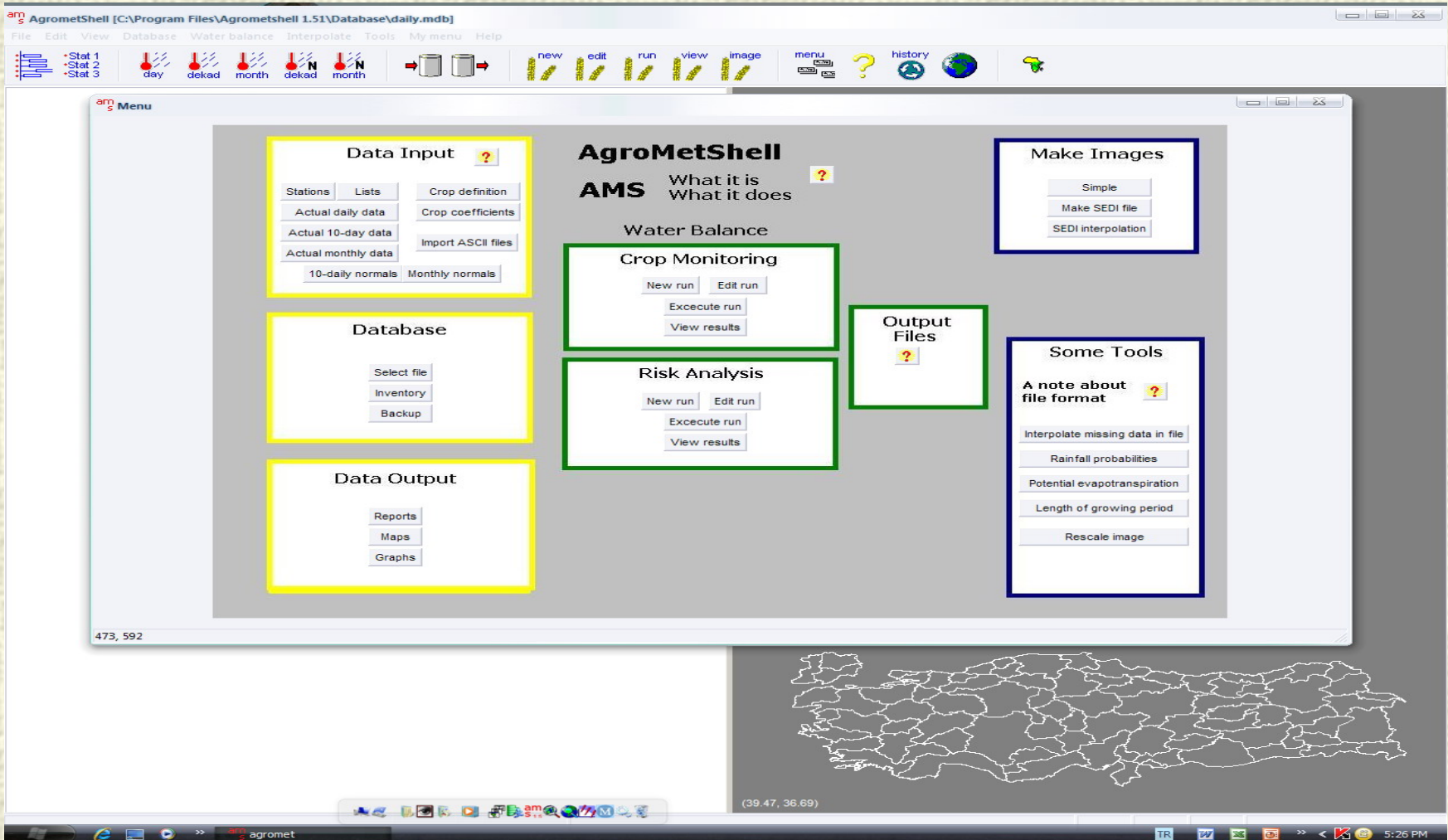
CROP MONITORING AND YIELD FORECASTING

Simulation Model (AgroMetShell)

- **Strengthening the Crop Yield and Production Forecasting Capability - (TCP/TUR/3002) supported by FAO, successfully carried on from 2005 to 2006 and completed as a cooperative study between Turkish State Meteorological Service and Ministry of Food, Agriculture and Livestock.**
- **The background required for crop monitoring and yield forecast is created after project conclusion. Yield forecast of 2007 is also completed into this extent and is published on the institutional webpage as a bulletin.**

CROP MONITORING AND YIELD FORECASTING

AgroMetShell(AMS) 1.51 Version Homepage



473, 592

(39.47, 36.69)

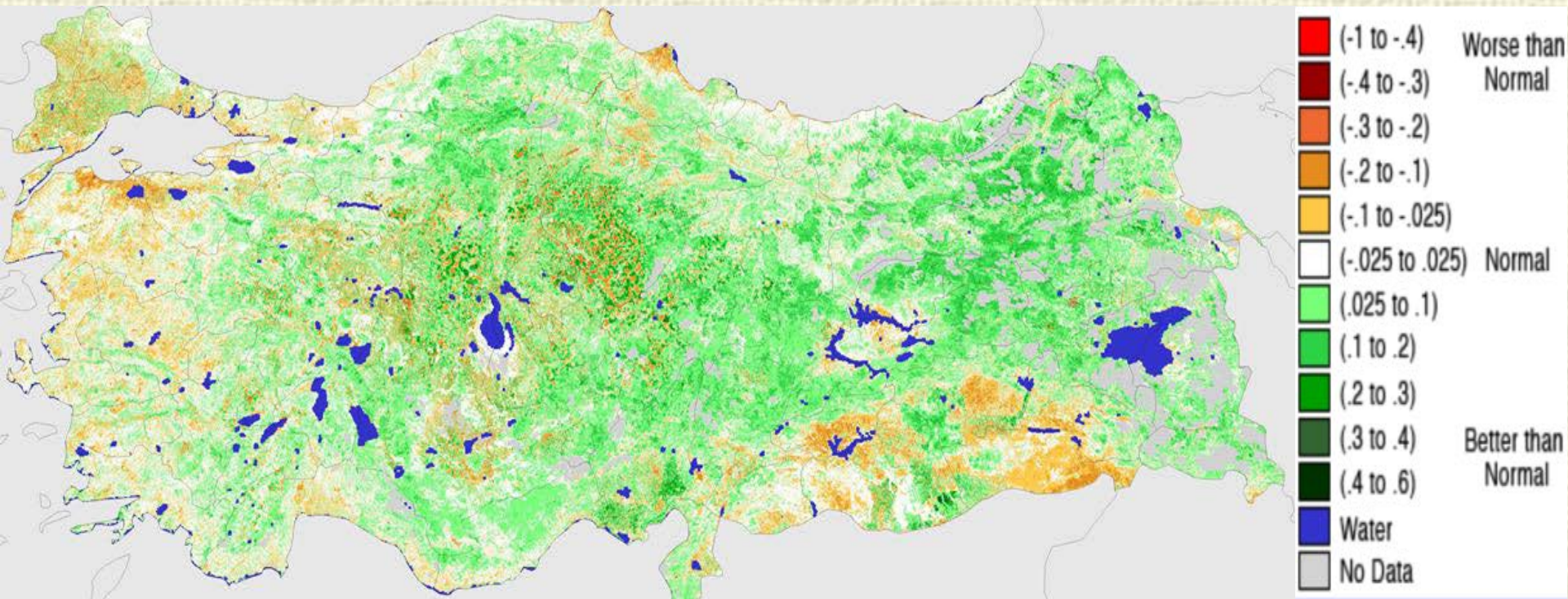
agromet

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CROP MONITORING AND YIELD FORECASTING

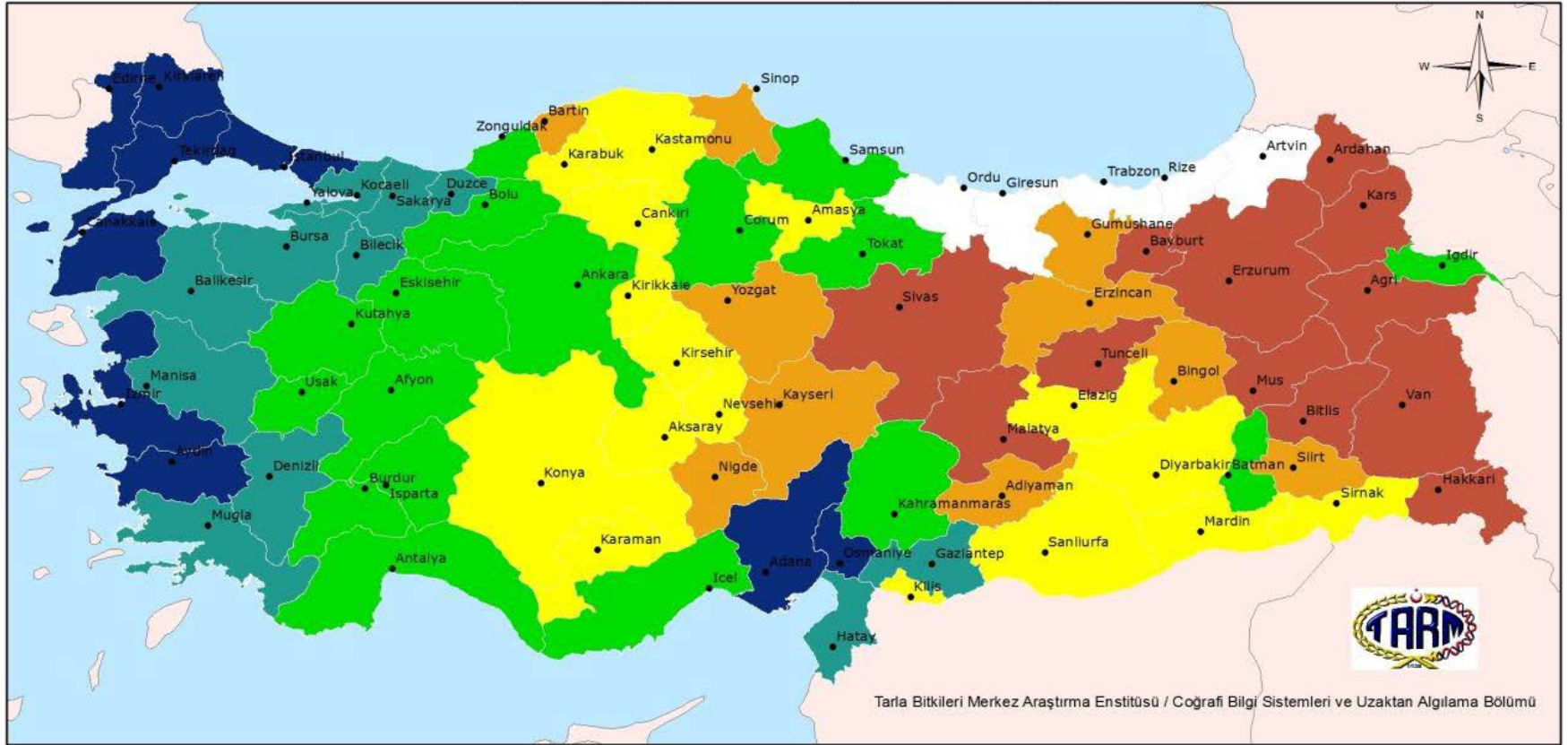
Comparison NDVI map of 2013 and normals
(between 9 to 24 May)





CROP MONITORING AND YIELD FORECASTING

Yield Forecast Map for Winter Wheat (2013)



2012 - 2013 verim tahmini (ton / ha)

0.83 - 1.3 1.4 - 1.6 1.7 - 1.9 2.0 - 2.4 2.5 - 3.1 3.2 - 4.1

Değerlendirme dışı

0 50 100 200 300 400 Km



IRRIGATION PLANNER SYSTEM



Definition

- Program was developed for planning of irrigation time which is used by farmers and reserchers as desicion support system.
- Daily rainfall and referance evapotranspiration values used as input to calculate daily water balance.
- Evapotranspiration is the sum of evaporation from surface and transpiration from leaves which is calculated by FAO Penman-Monteith Formula.

IRRIGATION PLANNER SYSTEM

The last column shows the water budget and water deficit

SUBİS 2.0 Sulama Bilgi Sistemi

Sulama Bilgi Sistemi Ana Sayfa | Yağış Tahmin Haritaları | Kullanma Klavuzu

Ekim Tarihi: 01.10.2013 | Bulunduğu Yer: Ankara Bölge

Yıl	Ekim 2013						Kas
Pzt	Sal	Çar	Per	Cum	Cmt	Paz	
30	1	2	3	4	5	6	
7	8	9	10	11	12	13	
14	15	16	17	18	19	20	
21	22	23	24	25	26	27	
28	29	30	31	1	2	3	
4	5	6	7	8	9	10	

Tabloyu Göster

SU BÜTÇESİ-SULAMA PLANLAMA TABLOSU

Gün	Ay	Yıl	Gün Sayısı	Yağış (mm)	Kümülatif Yağış (mm)	Referans Evapotranspirasyon (mm)	Kümülatif Referans Evapotranspirasyon (mm)	Su Bütçesi (mm)
17	2	2014	1	0	0	1,5	1,5	-1,5
16	2	2014	2	3,9	3,9	1,3	2,9	1,0
15	2	2014	3	0,5	4,4	1,0	3,8	0,6
14	2	2014	4	0	4,4	1,9	5,7	-1,3
13	2	2014	5	0	4,4	1,9	7,6	-3,2
12	2	2014	6	0	4,4	0,0	7,6	-3,2
11	2	2014	7	0,5	4,9	1,4	8,9	-4,0
10	2	2014	8	1,8	6,7	1,0	9,9	-3,2
9	2	2014	9	0	6,7	1,1	11,0	-4,3
8	2	2014	10	0	6,7	1,4	12,4	-5,7
7	2	2014	11	0	6,7	1,2	13,6	-6,9
6	2	2014	12	0	6,7	1,2	14,8	-8,1
5	2	2014	13	0	6,7	1,2	16,0	-9,3
4	2	2014	14	0	6,7	1,0	17,0	-10,3

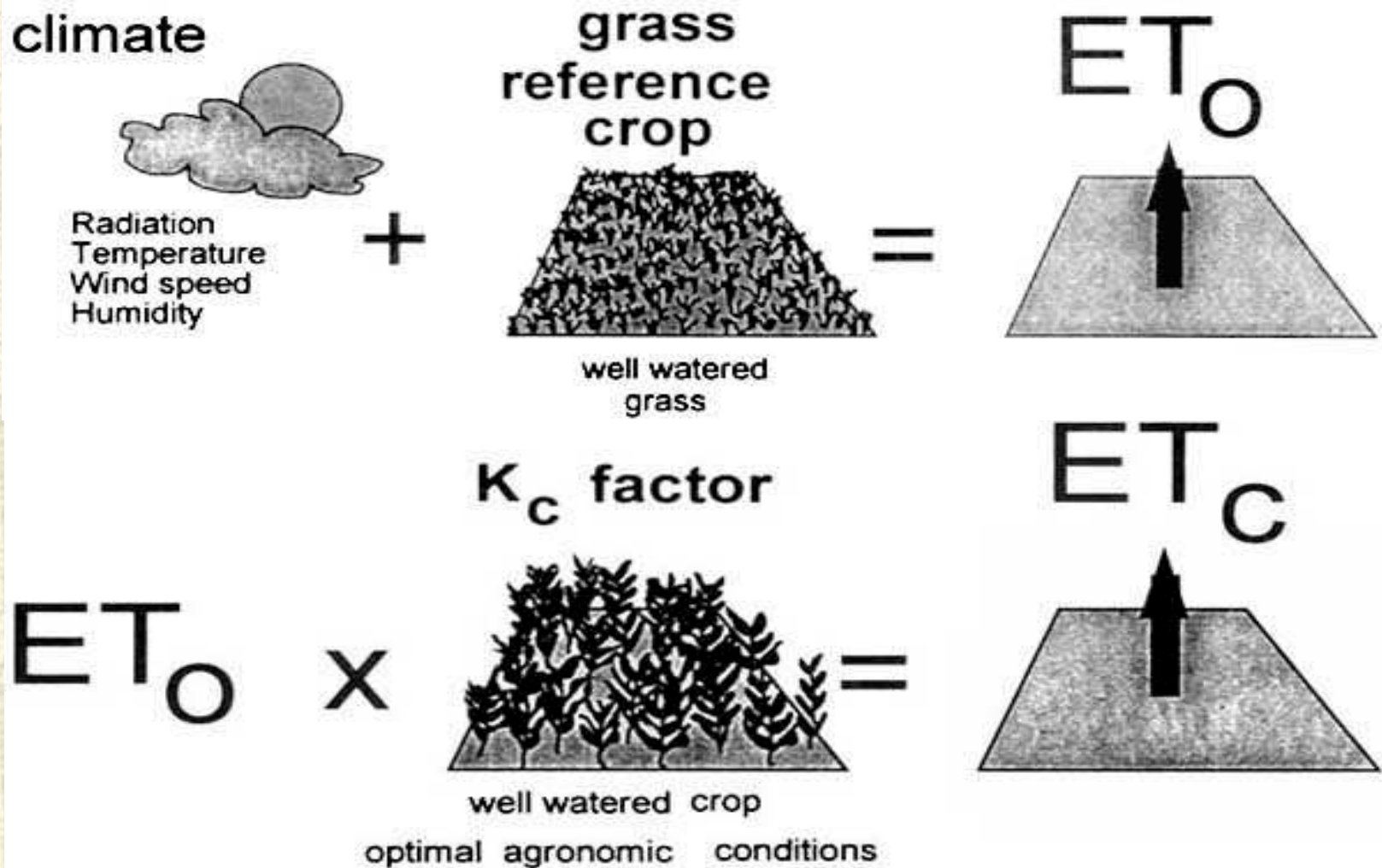


NORMALS OF REFERENCE EVAPOTRANSPIRATION

- There are many theoretical and empirical equations around the world to estimate ETo. The choice of any one method depends on the accuracy of the equation under a given condition and the availability of the required data. For reference surfaces with known biophysical properties, the main factors affecting ETo include solar radiation, relative humidity/vapor pressure, air temperature, and wind speed. Therefore, ETo can be estimated quite accurately using a "model" (a series of complex mathematical equations).
- We used FAO Penman-Monteith equation in order to calculate ETo for TURKEY. The AgroMetShell model was worked for 257 weather stations by using daily weather data. The weather data used between 1981 to 2011. By using these data, monthly and yearly normals of ETo were calculated and maps were drawn.

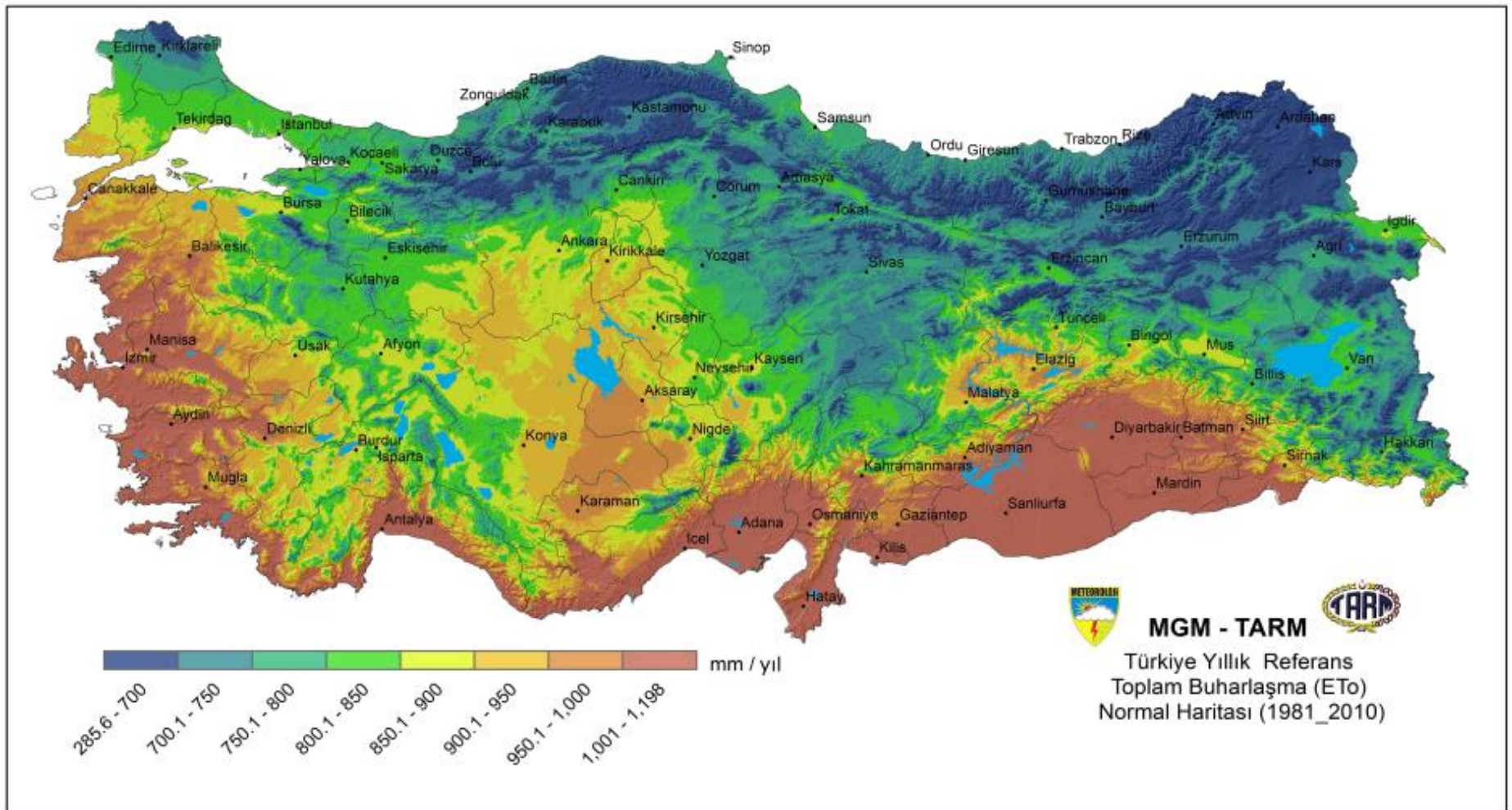
NORMALS OF REFERENCE EVAPOTRANSPIRATION

Reference Evapotranspiration



NORMALS OF REFERENCE EVAPOTRANSPIRATION

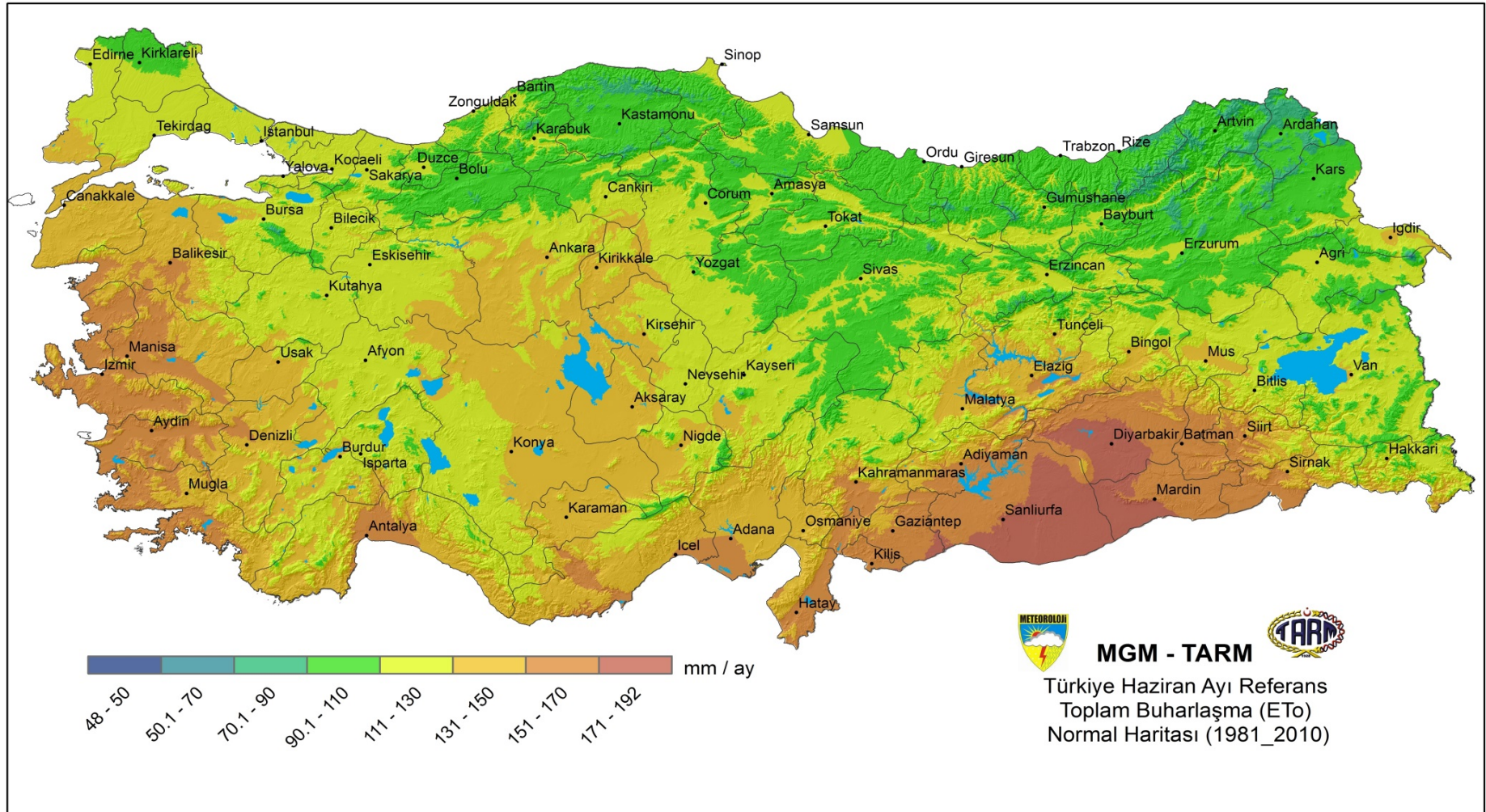
Yearly Normal Map of Grass Reference ETo for TURKEY





NORMALS OF REFERENCE EVAPOTRANSPIRATION

June Normal Map of Grass Reference ETo for TURKEY



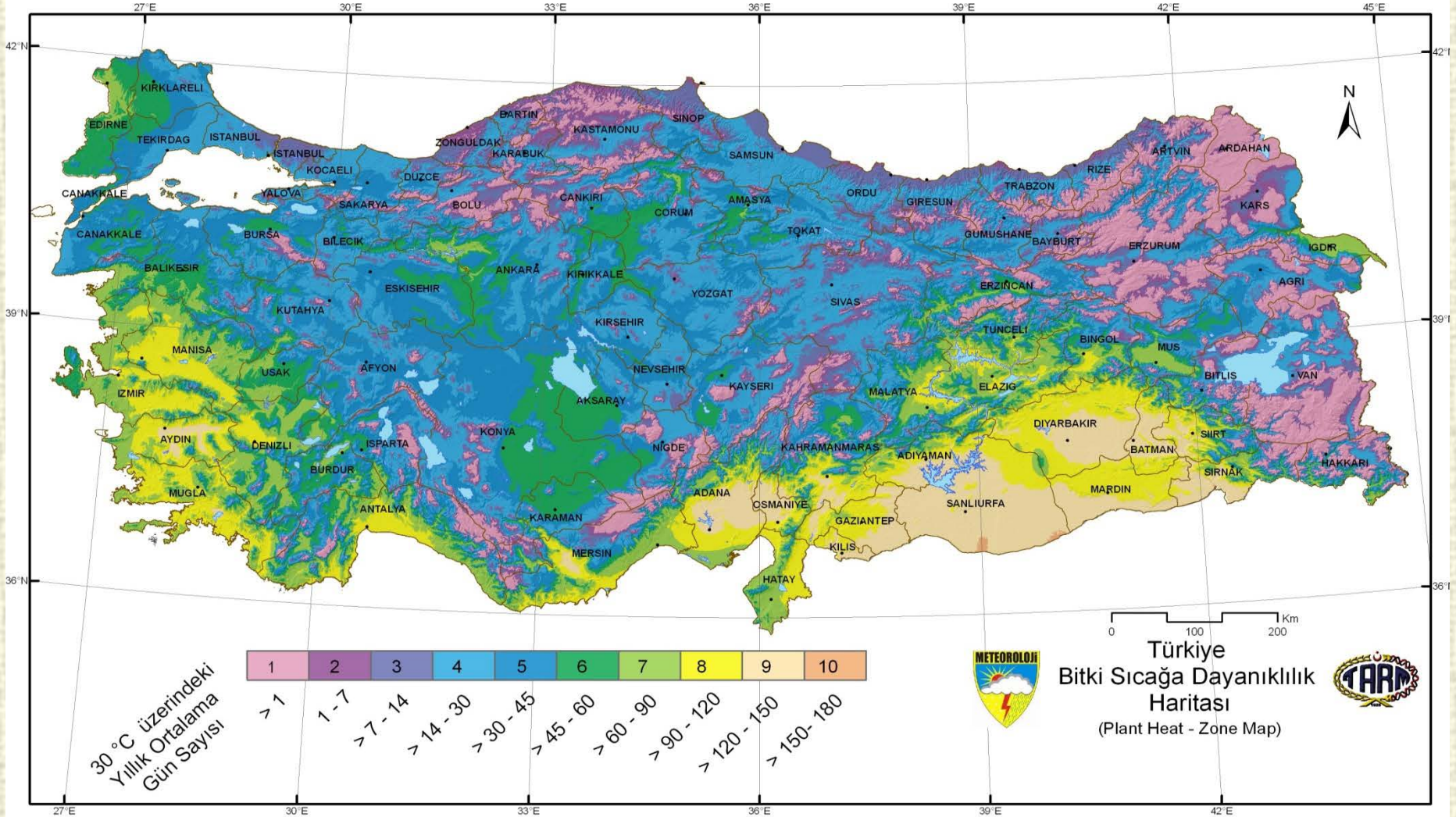


HEAT AND HARDINESS ZONE MAPS

- Many factors influence which plants will thrive in a given location. Heat, cold, and elevation are just a few that can have a big impact. If you're trying to figure out which plants to use in your garden, check out the maps below that designate plant zones based on various important factors.
- Heat Zone Map:
 - The American Horticultural Society's Plant Heat Zone Map divides the country into zones based on average high temperatures.
- Hardiness Zone Map:
 - The U.S. Department of Agriculture offers an interactive map that divides regions based on average minimum temperatures.

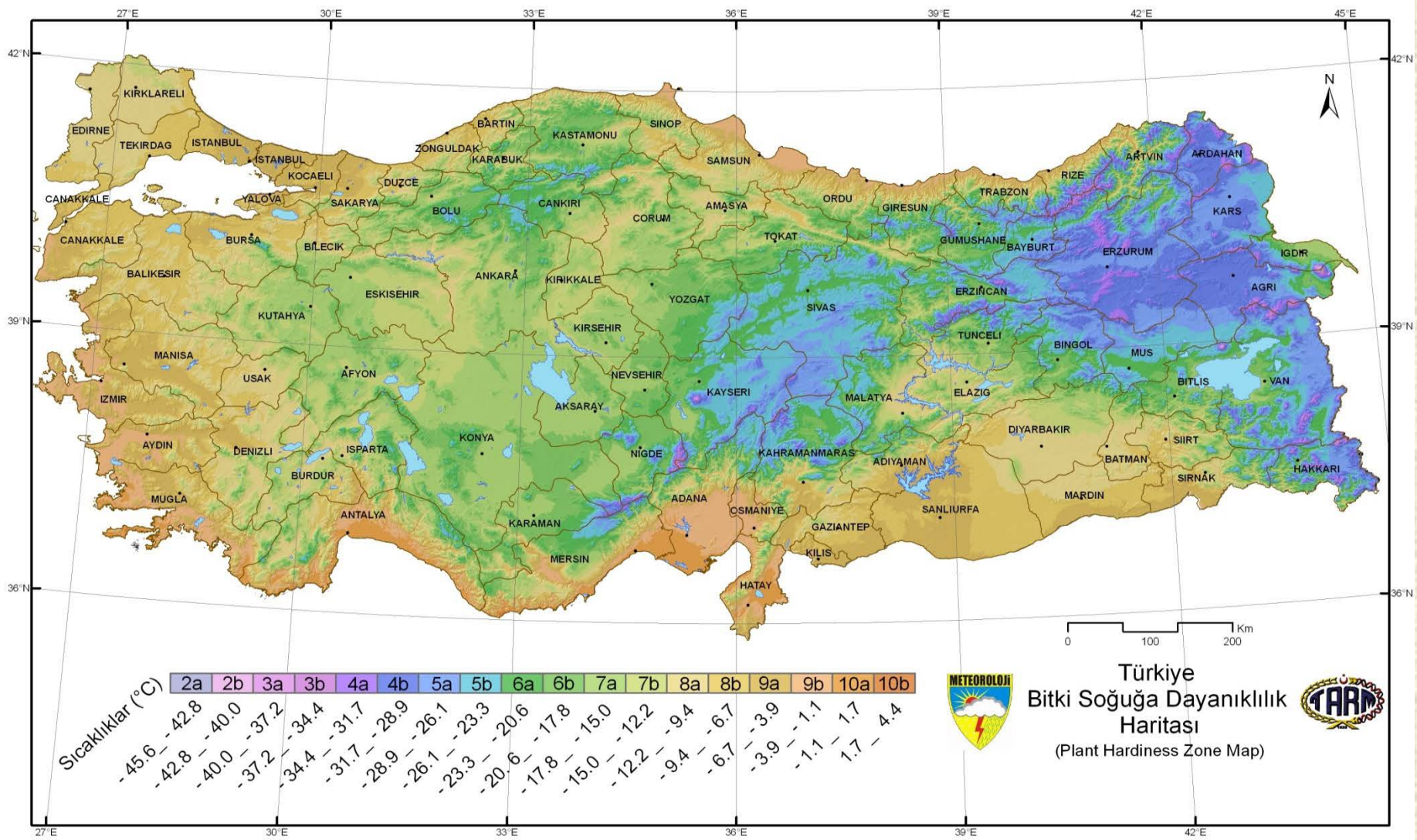


HEAT AND HARDINESS ZONE MAPS





HEAT AND HARDINESS ZONE MAPS





HEAT AND HARDINESS ZONE MAPS

TÜRKİYE İL MERKEZLERİ BİTKİ SOĞUĞA DAYANIKLILIK TABLOSU

BÖLGE	SICAKLIKLAR		İLLER
	(°C)	(°F)	
4a	-31.7_-34.4	-25_-30	Ağrı
4b	-28.9_-31.7	-20_-25	Ardahan, Erzurum
5a	-26.1_-28.9	-15_-20	Kars, Muş
5b	-23.3_-26.1	-10_-15	
6a	-20.6_-23.3	-5_-10	Bayburt, Kayseri, Sivas
6b	-17.8_-20.6	0_-5	Erzincan, Gümüşhane, Karaman
7a	-15.0_-17.8	5_0	Afyonkarahisar, Aksaray, Bingöl, Bitlis, Bolu, Çorum, Eskişehir, Hakkari, Iğdır, Kastamonu, Kırşehir, Konya, Nevşehir, Niğde, Tunceli, Van, Yozgat
7b	-12.2_-15.0	10_5	Ankara, Çankırı, Diyarbakır, Elazığ, Kırıkkale, Kütahya, Tokat, Isparta,
8a	-9.4_-12.2	15_10	Amasya, Bartın, Batman, Burdur, Düzce, Edirne, Karabük, Kırklareli, Malatya, Uşak,
8b	-6.7_-9.4	20_15	Artvin, Balıkesir, Bilecik, Bursa, Gaziantep, Mardin, Siirt, Şırnak, Tekirdağ
9a	-3.9_-6.7	25_20	Adıyaman, Çanakkale, Denizli, Kocaeli, Kilis, Manisa, K.Maraş, Muğla, Osmaniye, Sakarya, Şanlıurfa, Yalova
9b	-1.1_-3.9	30_25	Adana, Aydın, Giresun, Hatay, İstanbul, İzmir, Ordu, Rize, Samsun, Sinop, Trabzon, Zonguldak
10a	1.7_-1.1	35_30	Antalya, Mersin

TÜRKİYE İL MERKEZLERİ BİTKİ SICAĞA DAYANIKLILIK TABLOSU

BÖLGE	GÜN SAYISI	İLLER
2	1 - 7	Ardahan, Giresun, Samsun, Sinop Trabzon, Zonguldak
3	> 7 - 14	Erzurum, Kars, Ordu, Tekirdağ, Van, Yozgat
4	> 14 - 30	Artvin, Bartın, Bayburt, Bolu, İstanbul, Kastamonu, Nevşehir, Sivas, Yalova
5	> 30 - 45	Afyonkarahisar, Ağrı, Ankara, Bilecik, Bitlis, Çanakkale, Çorum, Düzce, Eskişehir, Gümüşhane, Hakkari, Kırşehir, Kocaeli, Kütahya, Niğde, Sakarya, Tokat
6	> 45 - 60	Aksaray, Balıkesir, Bursa, Çankırı, Erzincan, Isparta, Karaman, Kayseri, Kırıkkale, Kırklareli, Konya, Uşak
7	> 60 - 90	Amasya, Bingöl, Burdur, Edirne, Elazığ, Iğdır, İzmir, Malatya, Mersin, Muğla, Muş, Şırnak
8	> 90 - 120	Antalya, Denizli, Gaziantep, Hatay, Kahramanmaraş, Manisa, Mardin, Siirt, Tunceli
9	> 120 - 150	Adana, Adıyaman, Aydın, Batman, Diyarbakır, Kilis, Osmaniye, Şanlıurfa



AGROMETEOROLOGICAL BULLETIN



- The products which are results of the studies in Research Department are combined as a monthly bulletin and published on the institutional webpage.
- This bulletin includes precipitation, temperature, drought and extreme events analysis, crop monitoring and yield forecasting and regional reports of agricultural situation.
- Everyone can appreciate all of the analysis of last month in one bulletin.



Agrometeorological Bulletin



METEOROLOJİ GENEL MÜDÜRLÜĞÜ ARAŞTIRMA DAİRESİ BAŞKANLIĞI

AYLIK ZİRAİ METEOROLOJİ BÜLTENİ

Sayı : 93

Kasım 2013

Tasarım-Düzenleme : *Murat YILDIZIM*

YAĞIŞ DEĞERLENDİRMESİ 2013 YILI EKİM AYI YAĞIŞ RAPORU

GENEL DURUM:

Yağışlar genel olarak normalinden ve geçen yıl Ekim ayı yağışından fazla olmuştur.

Ekim ayı yağış ortalaması 62,0 mm, normali 59,6 mm ve 2012 Ekim ayı yağış ortalaması ise 54,9 mm'dir. Yağışlarda normaline göre % 4,0 geçen yıl Ekim ayı yağışına göre ise % 12,9 artış gözlenmiştir.

MARMARA BÖLGESİ:

Bölge yağış ortalaması 87,9 mm, normali 72,4 mm, 2012 Ekim ayı yağışı ise 81,1 mm'dir. Yağışlarda normaline göre % 21,4 geçen yıl Ekim ayı yağışına göre ise % 8,3 artış gözlenmiştir.

EGE BÖLGESİ:

Bölge yağış ortalaması 79,7 mm, normali 42,3 mm, 2012 Ekim ayı yağışı ise 43,4 mm'dir. Yağışlarda normaline göre % 88,6 geçen yıl Ekim ayı yağışına göre ise % 83,7 artış gözlenmiştir.

AKDENİZ BÖLGESİ:

Bölge yağış ortalaması 62,2 mm, normali 59,8 mm, 2012 Ekim ayı yağışı ise 75,2 mm'dir. Yağışlarda normaline göre % 4,1 artış, geçen yıl Ekim ayı yağışına göre ise % 17,3 azalma gözlenmiştir.



THANKS...

Dr. Osman ŞİMŞEK

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