REPUBLIC OF TURKEY

THE MINISTRY of FORESTRY AND WATER AFFAIRS

TURKISH STATE METEOROLOGICAL SERVICE

METEOROLOGICAL OBSERVATIONS

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Head of Observation Systems Department

25 FEBRUARY 2014

Orman,Su Varsa Hayat Var.

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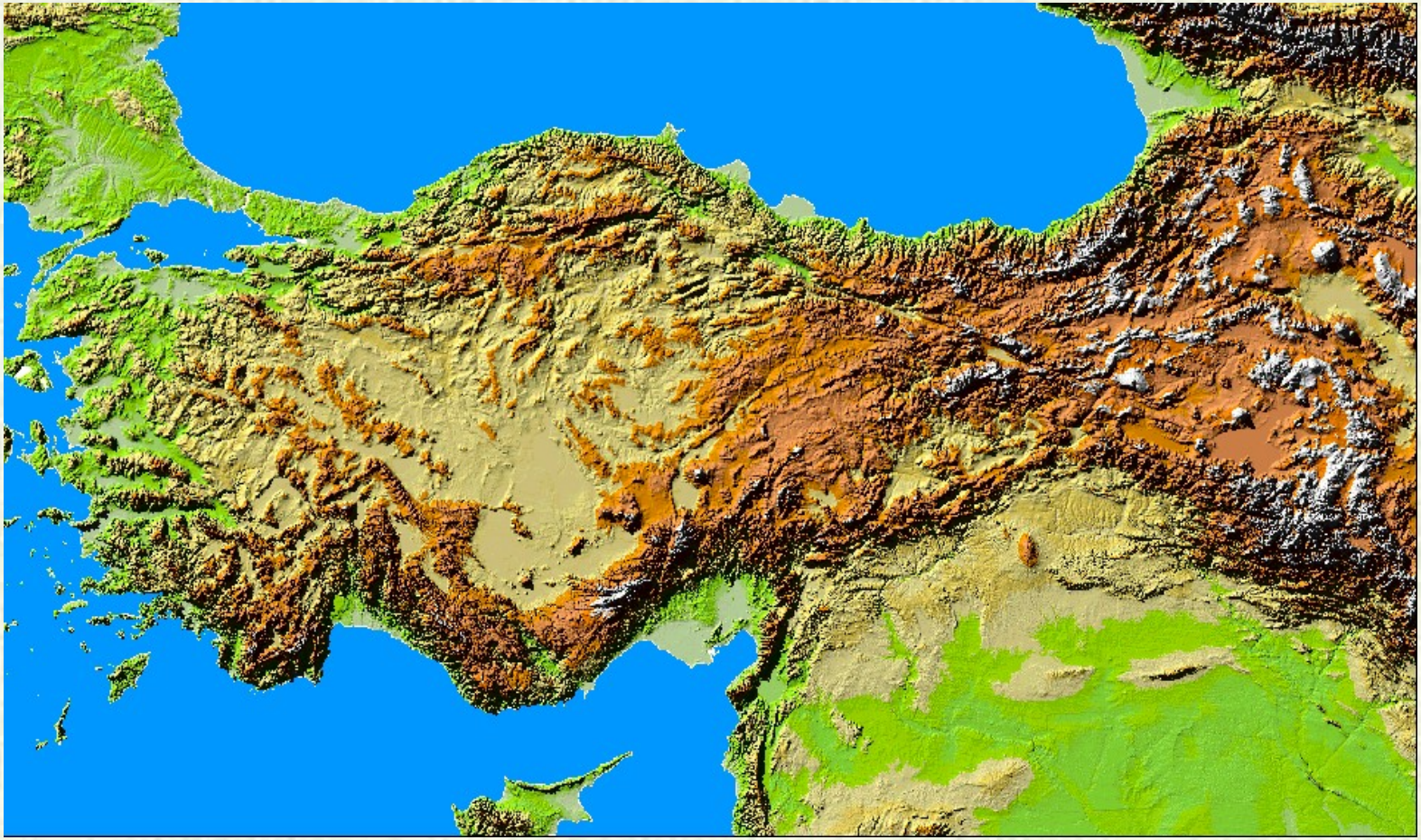
TURKEY

- Unique position between the continents
- Surrounded by the seas
- Open to different air masses
- Occurrence of several meteorological phenemona even on same day

TOPOGRAPHICAL CONDITIONS

- Very hard, sharply and suddenly changing topography
- Several micro-climatological regions
- Difficult for making the observations and weather forecasting



INTRODUCTION

Observations

Data Analysis/Forecast /Research

Serving the products to users

INTRODUCTION

The observations as the essential input of any meteorological products provided for the users must be;

- **more reliable,**
- **more accurate,**
- **continuous,**
- **timely,**

INTRODUCTION

In order to meet the meteorological service and product requirements:

- **Surface observation network**
- **Marine observation network**
- **Upper air observation network**
- **Weather radars**
- **Satellite ground receiving system**

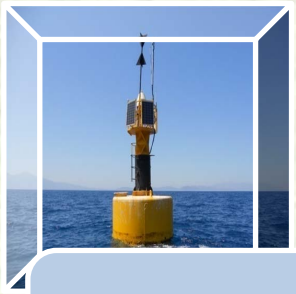
OBSERVATION NETWORK

1021 AWOS

+

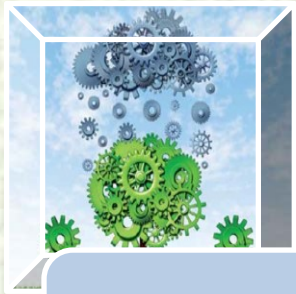
62 Airport AWOS

+



70 Marine AWOS

=



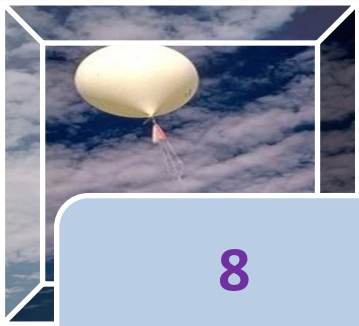
1153 AWOS

10 C-Band Radar

1 X-Band Radar

2 Marine Radar

+

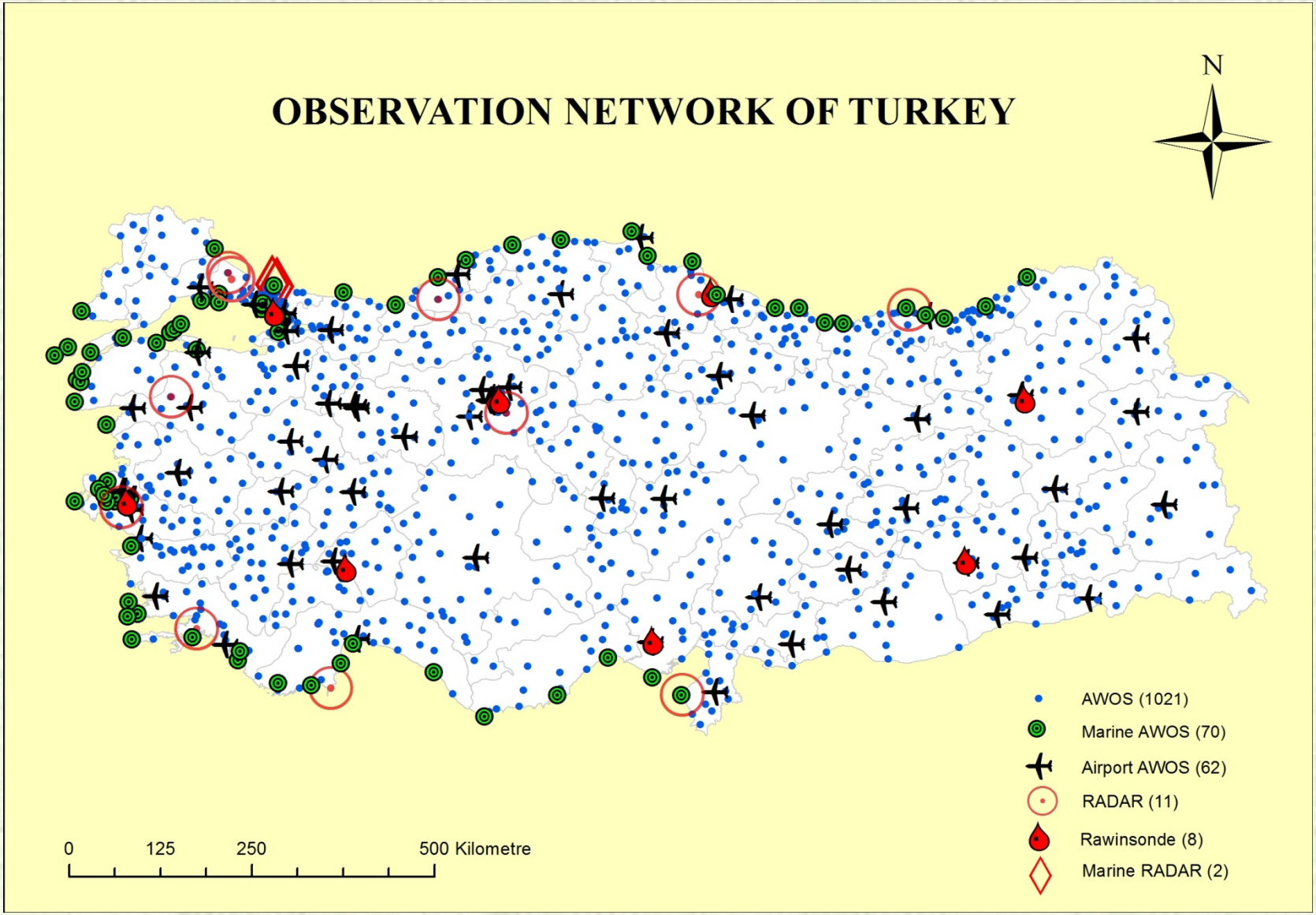


8 Upper Air Station

=

1174 Observation Systems

OBSERVATION NETWORK



SURFACE OBSERVATION NETWORK

METEOROLOGICAL PARAMETERS

- Wind speed
- Wind direction
- Air temperature
- Dew point
- Relative humidity
- Air pressure
- Precipitation
- Snow depth
- Present weather
- Soil temperatures
- Solar radiation
- Evaporation
- Visibility
- Soil moisture
- Cloud coverage and types
- Height of cloud base
- Runway Visual Range
- Runway Surface Temperatu

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SURFACE OBSERVATION NETWORK

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METEOROLOJİ

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SURFACE OBSERVATION NETWORK

METEOROLOJİ

AIRPORT SYSTEMS

- 24 hours meteorological service at 68 airports
- AWOS with latest technology for meteorological observations at 62 airports in accordance with the category of the airport

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MARINE OBSERVATION NETWORK

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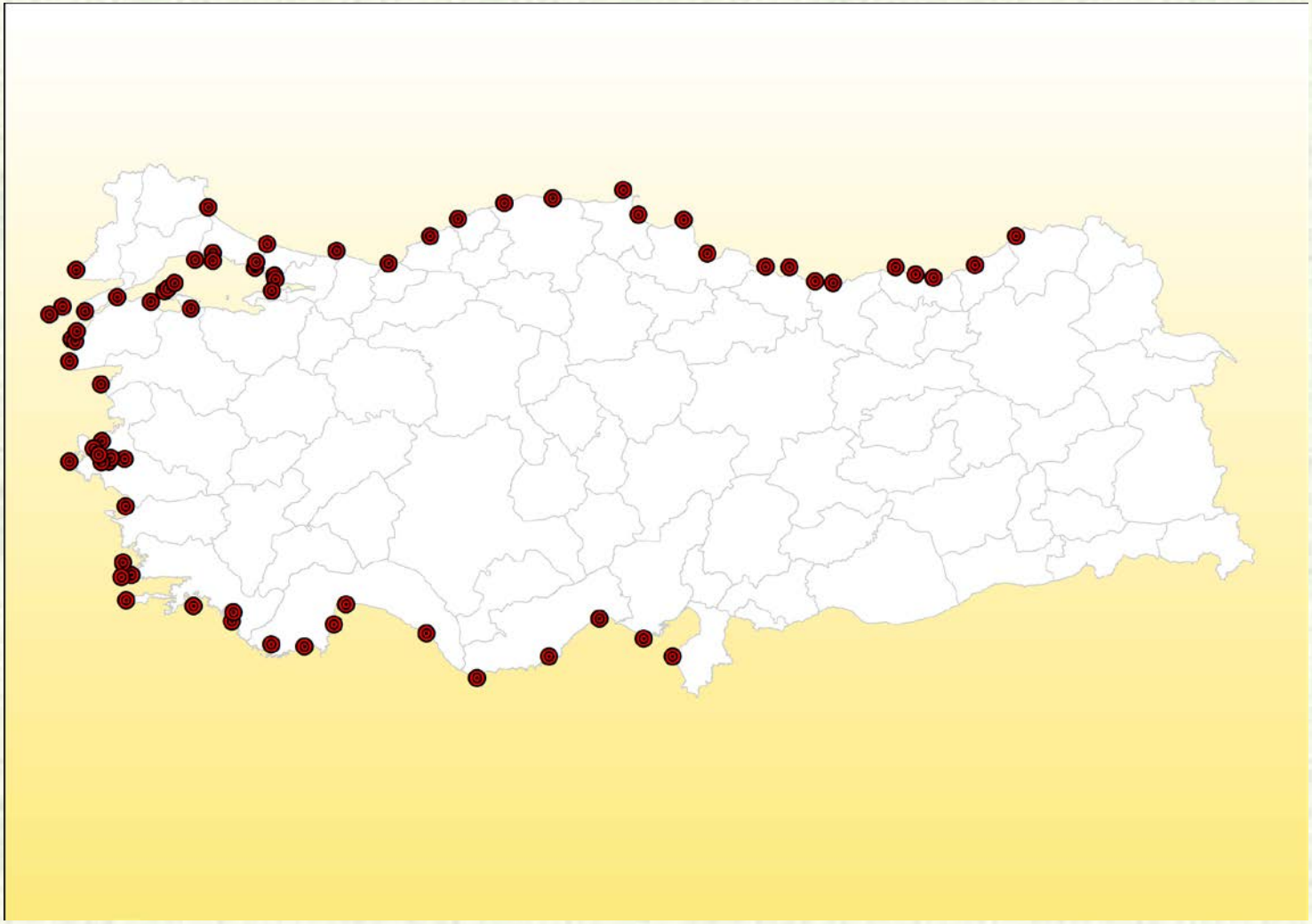
MARINE AWOS



MARINE OBSERVATION NETWORK

- 70 Marine Automatic Weather Observing Station
- 9 buoys

- Wind speed
- Wind direction
- Air temperature
- Sea water temperature
- Air pressure
- Precipitation
- Wave height
- Wave period
- Wave direction

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MARINE OBSERVATION NETWORK

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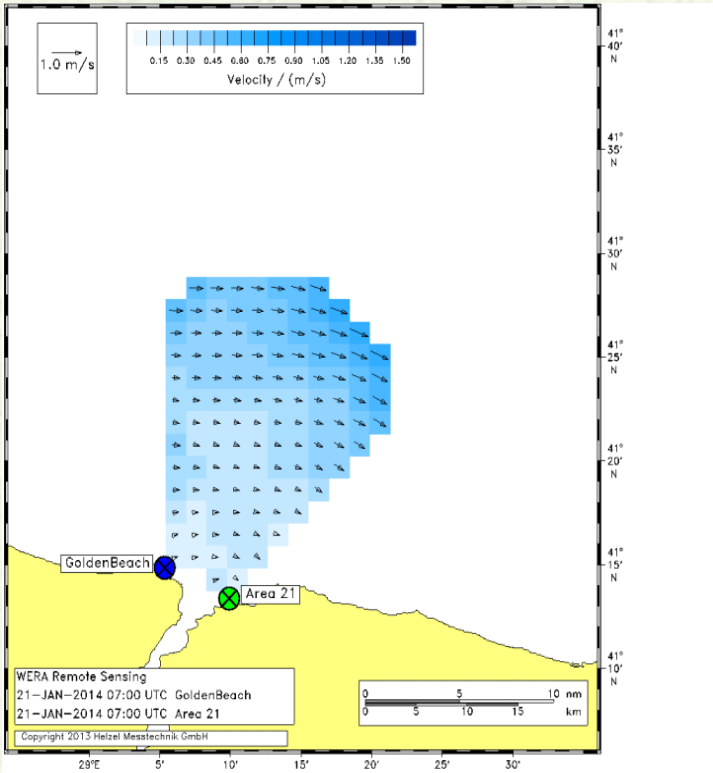
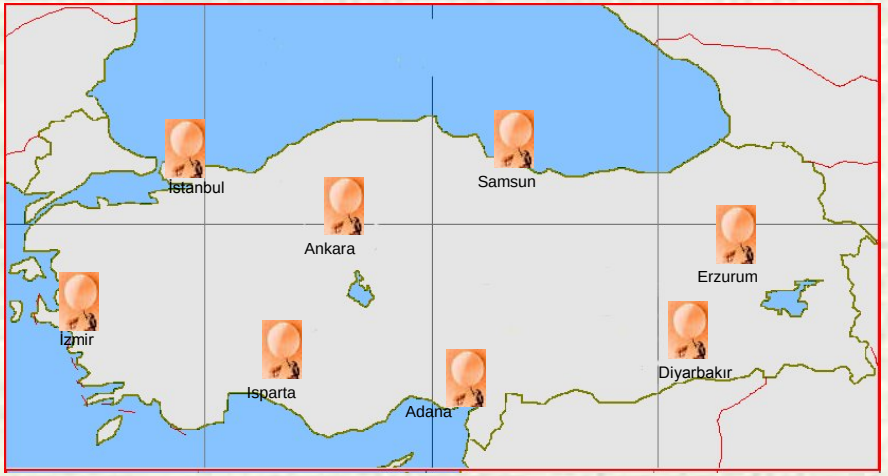
HIGH FREQUENCY MARINE RADAR

- Wave Height;Wave Spectrum
- Wind Direction; Wind Speed
- Current Direction; Current Speed

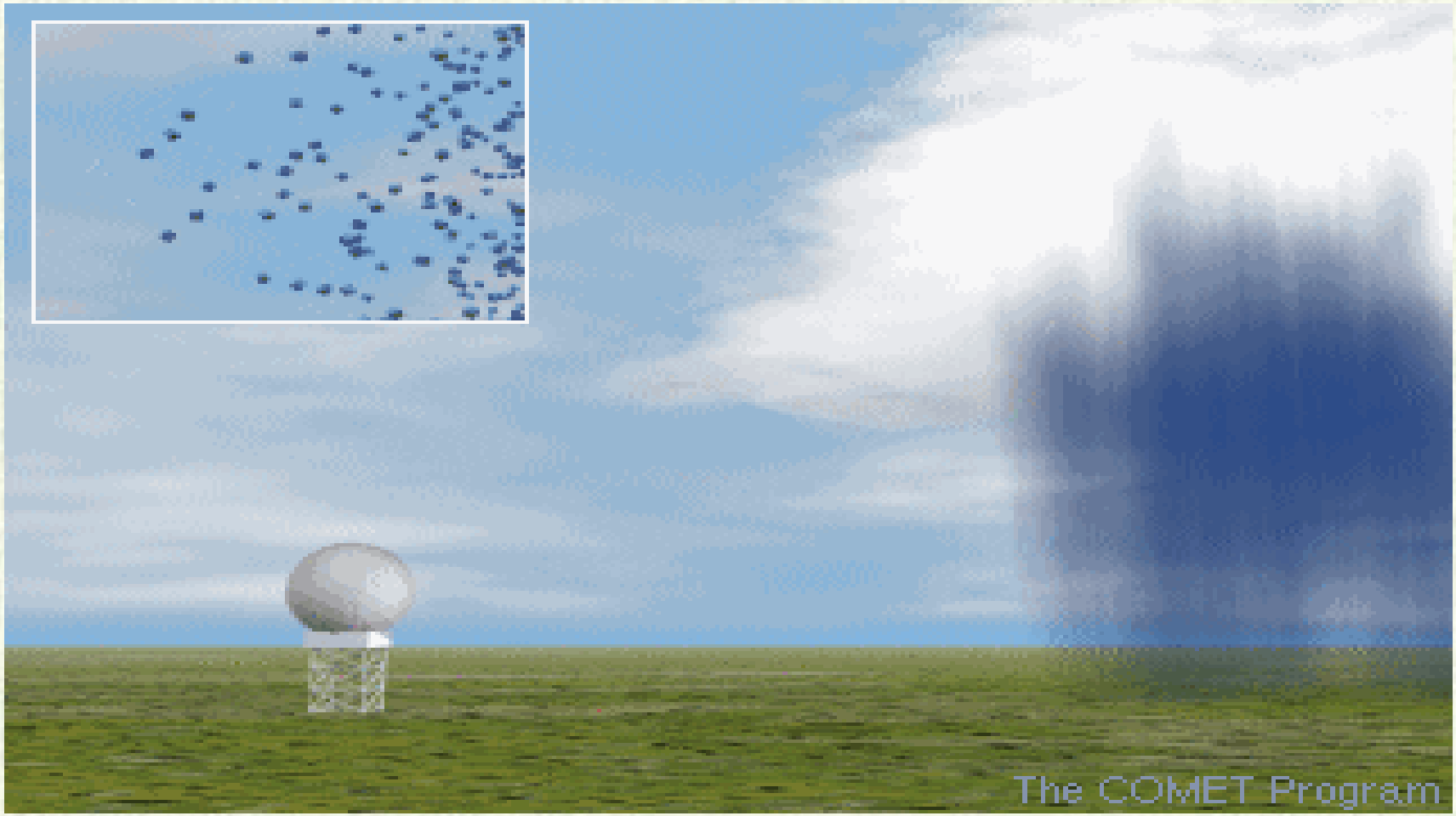


UPPER AIR OBSERVATIONS

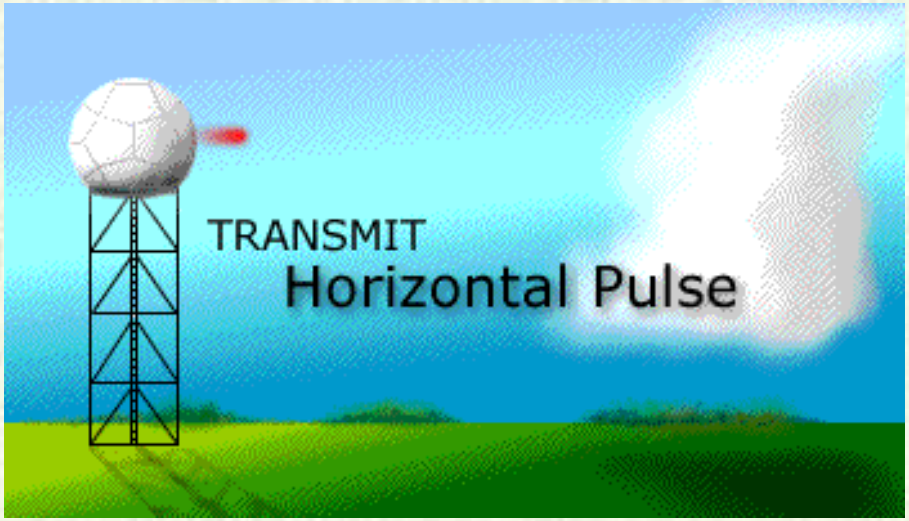
- 8 stations with GPS based system
- Twice launching a day (00 ve 12 UTC)
- Wind speed and direction, temperature and pressure information

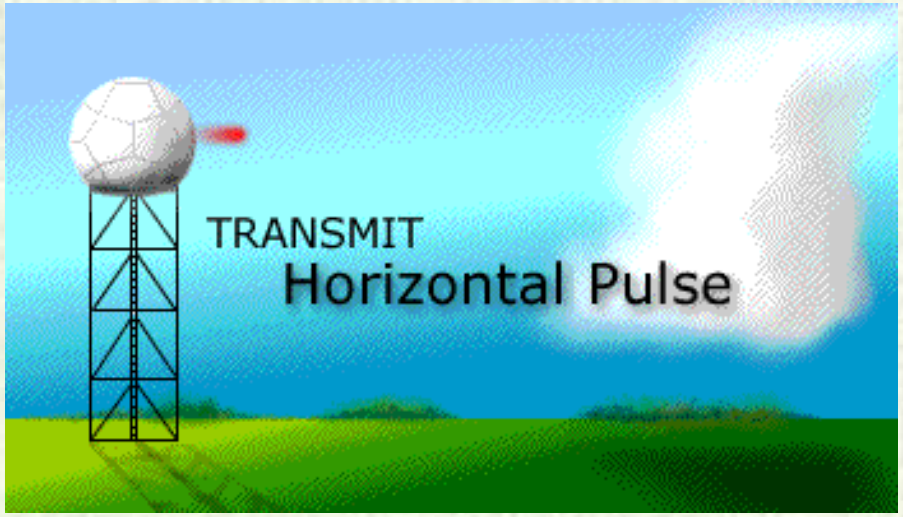


WEATHER RADAR NETWORK



WEATHER RADAR NETWORK



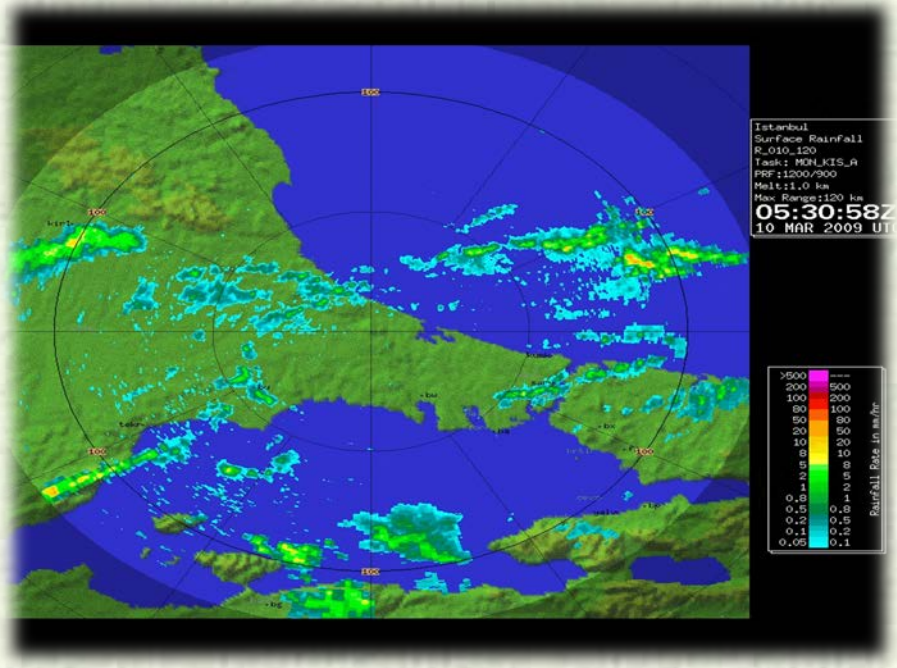


Single Polarization

Dual Polarization

WEATHER RADAR NETWORK

- C-Band Doppler Radars
- 150-200 km observing range
- Klystron transmitter; Digital receiver
- Narrow beam width (less than 1 degree)
- Composite product generation
- 5 radars with dual polarization capability



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WEATHER RADAR NETWORK

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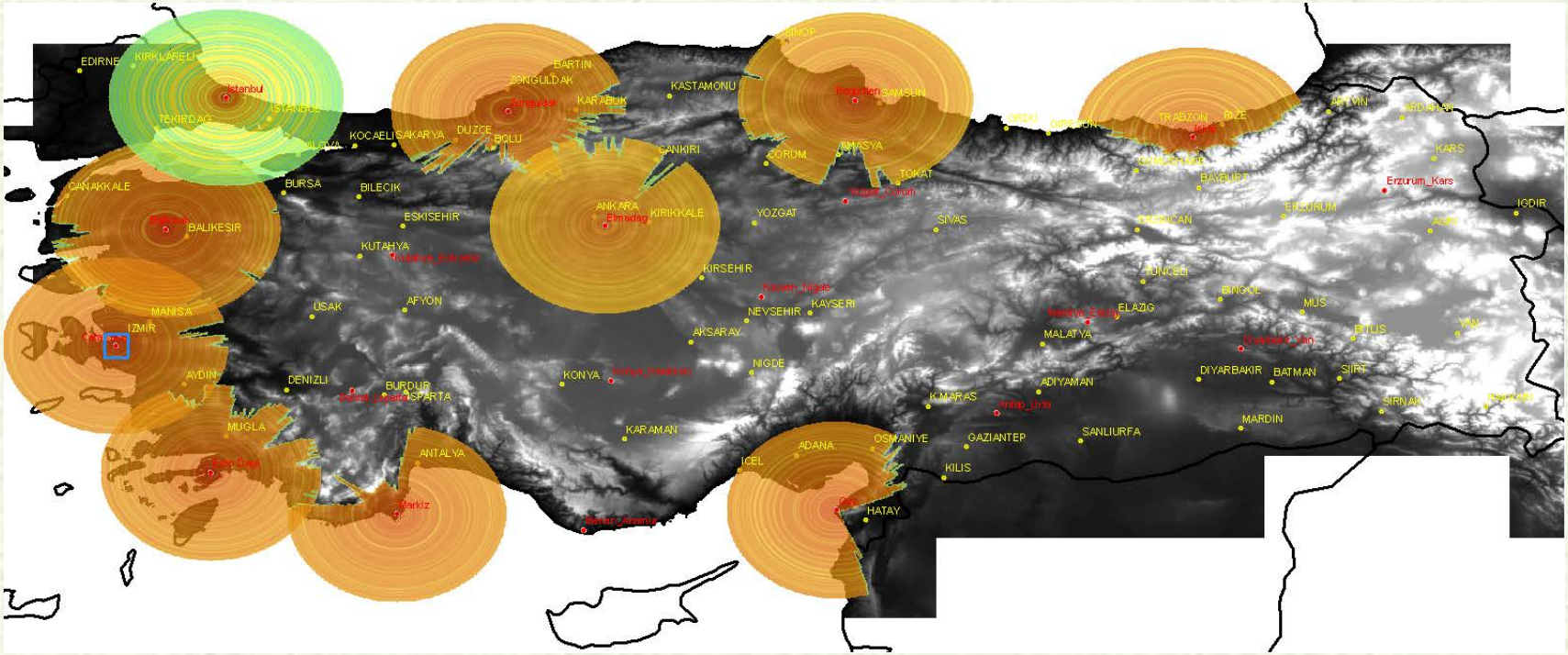
EXISTING RADARS AND COVERAGE MAP



10 Radars@150 km coverage

WEATHER RADAR NETWORK

MOBILE X-BAND RADAR

- 50-100 km observing range
- High resolution and sensitive measurements
- Low power, low cost
- More sensitive to atmospherical attenuation
- Better performance with dual polarization capability

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WEATHER RADAR NETWORK

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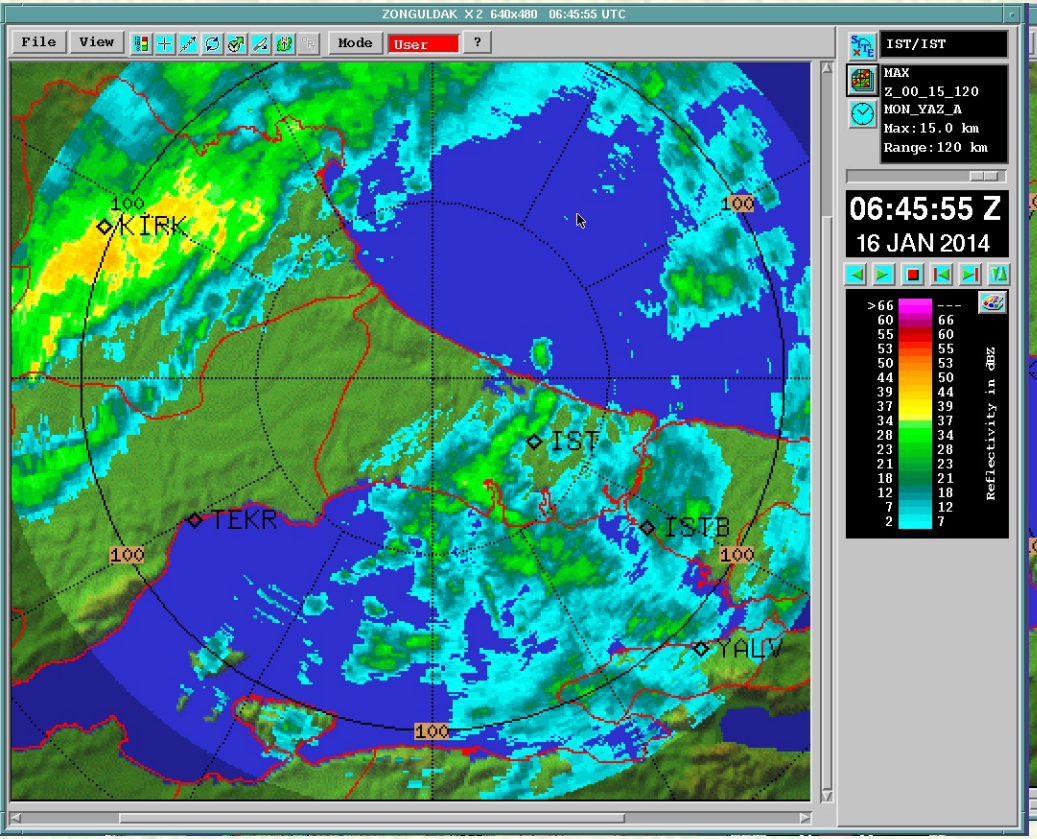

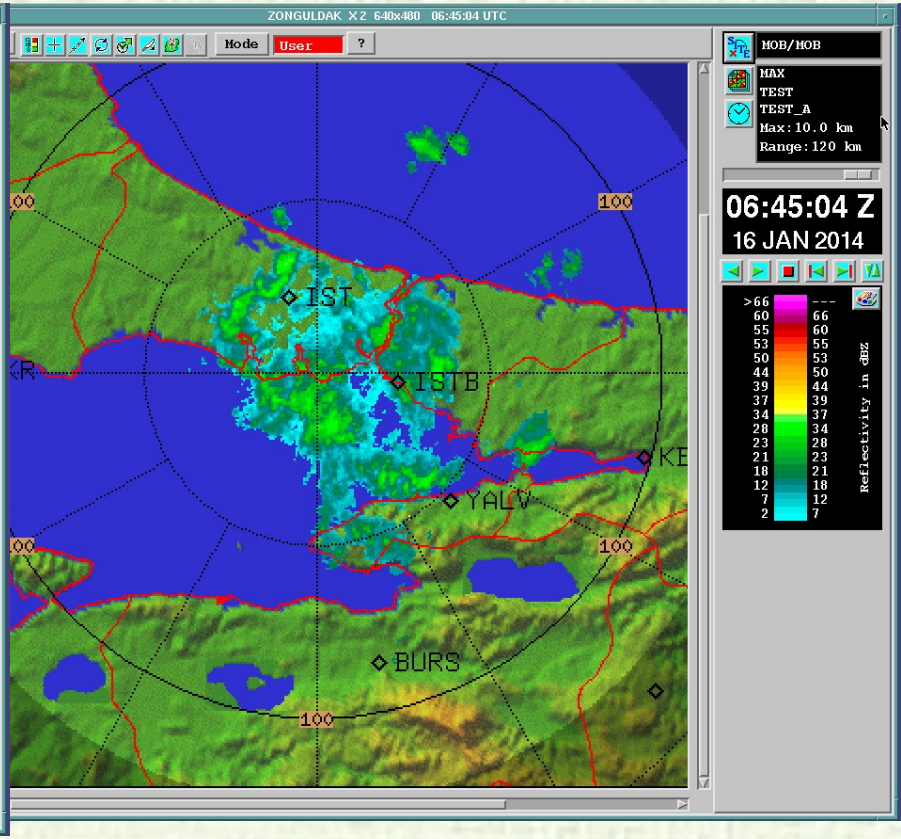

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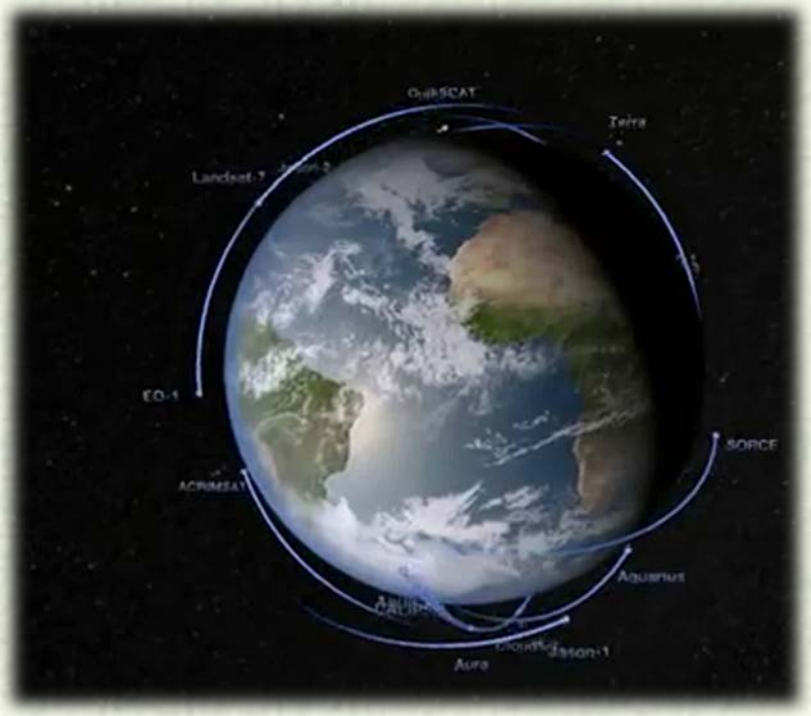
SATELLITE GROUND RECEIVING SYSTEM

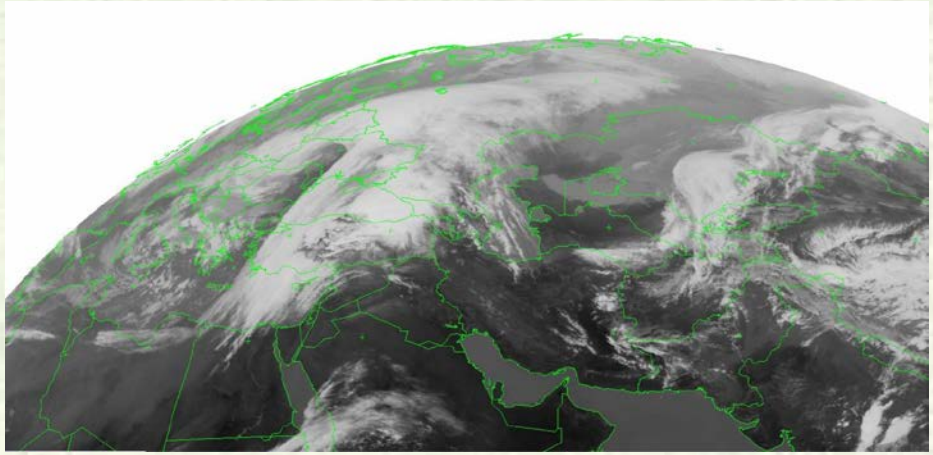
METEOROLOJİ

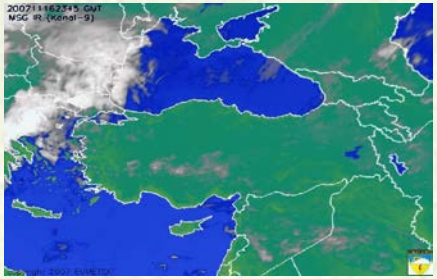
One of the founder members of EUMETSAT

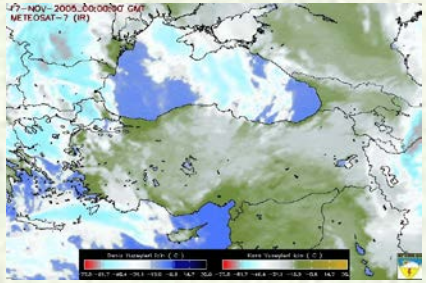
Receiving data for every 5 minutes from 13 satellites

- **Cloudiness; Precipitation rate**
- **Land & Sea;Surface temperature**
- **Snow cover;Vegetation ;Forest fire; Dust storm;**





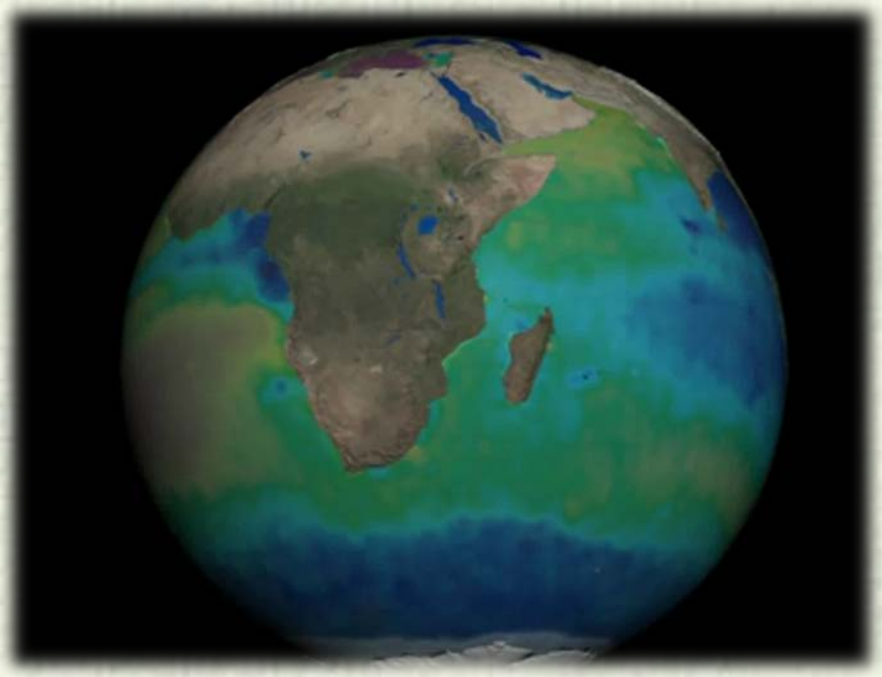


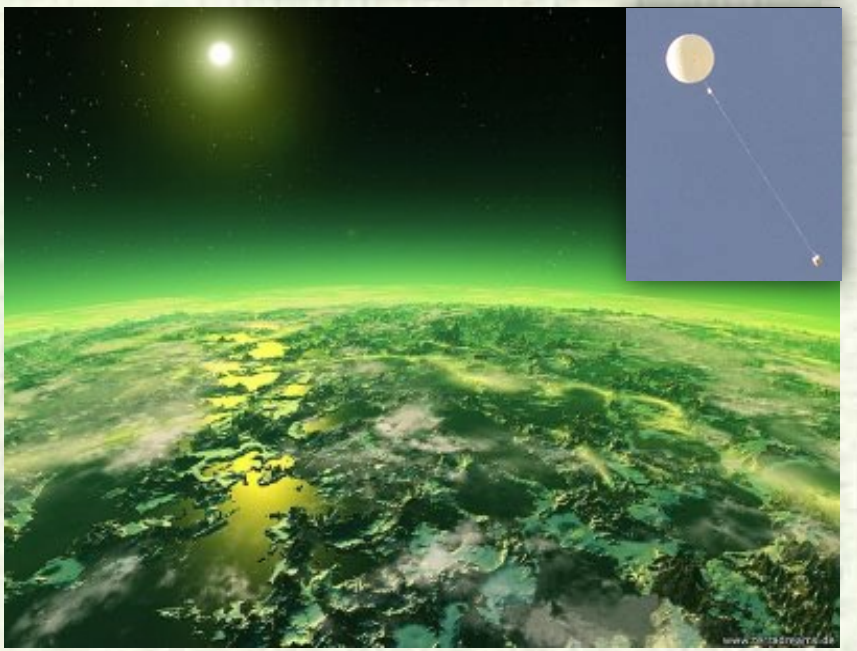


Ozon and UV observations

Ozon and UV radiation observation in Ankara by spectrophotometer

UV radiation observation in 15 stations





CALIBRATION CENTER

LABORATORIES COMPLY WITH INTERNATIONAL STANDARDS

- **TSMS has a very well designed and equipped calibration center with 8 calibration laboratories.**

Accredited Laboratories (TS EN ISO/IEC 17025:2005)

-Temperature

- Relative humidity

- Pressure

- Wind speed

Working by providing tracebility (TS EN ISO/IEC 17025:2005)

-Precipitation

- Solar radiation

- Electrical

- Wind direction

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CALIBRATION CENTER

METEOROLOJİ

TÜRK AKREDİTASYON KURUMU

AKREDİTASYON SERTİFİKASI

Kalibrasyon Laboratuvarı olarak faaliyet gösteren,

DEVLET METEOROLOJİ İŞLERİ GENEL MÜDÜRLÜĞÜ
KALİBRASYON MERKEZİ
Devlet Meteoroloji İşleri Genel Müdürlüğü
Kalibrasyon Merkezi
Kütükçü Ali Bey Cad. No:4 Kalaba
06120 ANKARA / TÜRKİYE

TÜRKAK tarafından yapılan denetim sonucunda TS EN ISO/IEC 17025:2005 Standardına göre Ek'te yer alan kapsamlarda akredite edilmiştir.

Akreditasyon No : AB-0072-K

Akreditasyon Tarihi : 30-Nisan-2010

Bu Sertifika, yukarıda açık adı ve adresi yazılı Kuruluşun TS EN ISO/IEC 17025:2005 Standardına, ilgili Yönetmelik ve Tebliğlere uygunluğunu sürdürmesi halinde 29-Nisan-2014, tarihine kadar geçerlidir.

Ali BOĞA
Yönetim Kurulu Başkanı

Atakan BAŞTÜRK
Genel Sekreter

F701-040 +90 312 410 82 00 - www.turkak.org.tr

TURKISH ACCREDITATION AGENCY

COPY OF THE ACCREDITATION CERTIFICATE

As a Calibration Laboratory,

METEOROLOJİ GENEL MÜDÜRLÜĞÜ
Kalibrasyon Merkezi
Kütükçü Ali Bey Cad. No:4 Kalaba
06120 ANKARA / TURKEY

is accredited in accordance with TS EN ISO/IEC 17025:2012 standard within the scope given in Annex following the assessment conducted by **TURKAK**.

Accreditation Number : AB-0072-K
Accreditation Date : 30 April 2010
Revision Date / Number : 30 May 2012 / 02

This certificate shall remain in force until **29 April 2014**, subject to continuing compliance with the standard **TS EN ISO/IEC 17025:2012**, related regulations and requirements.

H. İbrahim ÇETİN
Deputy Secretary General

F701-040 +90 312 419 32 00 - www.turkak.org.tr

Accreditation Certificate

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CALIBRATION CENTER

METEOROLOJİ

TÜRKAK
Kalibrasyon
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AB-0072-K

CALIBRATION CENTER

Calibration Center has been recognized as the calibration center for the members of Economic Cooperation Organization

Afghanistan
Azerbaijan
Iran
Kazakhstan
Kyrgyzstan

Pakistan
Tajikistan
Turkey
Turkmenistan
Uzbekistan

FUTURE PLAN

- Establishment of an integrated observation network consists of different types of observing systems

- Expanding the radar network to cover whole country as much as possible

- Basin based planning by analyzing each catchment with 100 m step of height for the installation of the systems to measure the precipitation particularly

FUTURE PLAN

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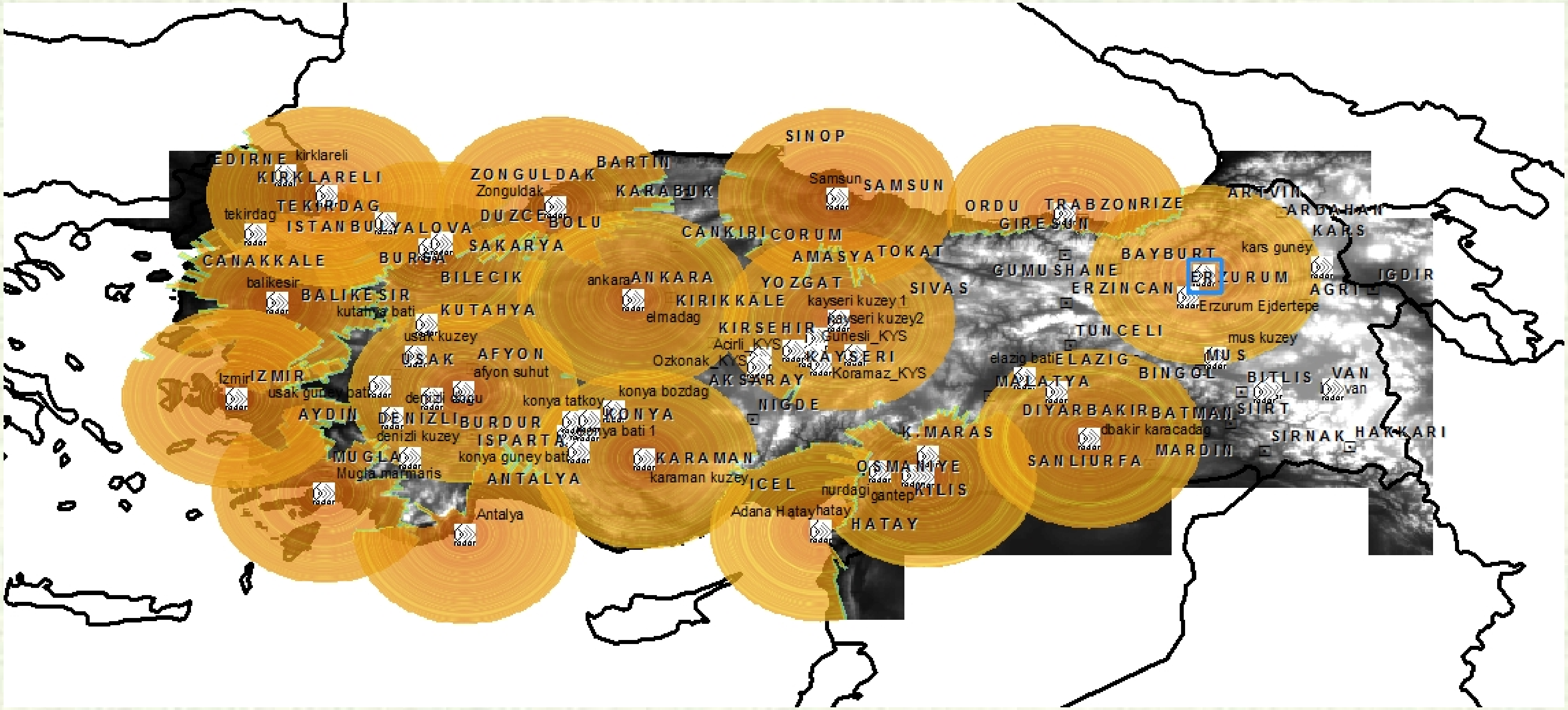
EXISTING+PLANNED RADARS AND COVERAGE MAP



17 Radars@150 km coverage

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FUTURE PLAN

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Height Steps	Akarçay	Antalya	Aras	Asi	Batıakdeniz	Batıkaradeniz	Burdur	Büyükenderes	Ceyhan	Çoruh	Doğu Akdeniz	Doğu Karadeniz	Fırat Dicle	Gediz	Kızılırmak	Konya Kapalı	Kuzeyege	Küçükmenderes	Marmara	Meriç	Sakarya	Seyhan	Susurluk	Van	Yeşilırmak	Total AWS
100	0	9	0	6	20	19	0	12	7	0	7	26	0	11	5	0	9	13	61	9	9	5	8	0	9	245
200	0	1	0	3	2	8	0	5	1	1	0	8	0	3	1	0	1	8	33	6	2	1	6	0	0	90
300	0	1	0	0	2	1	0	0	0	0	0	3	0	4	1	0	3	2	3	2	4	1	2	0	2	31
400	0	1	0	1	0	5	0	2	1	0	1	4	6	1	2	0	0	2	2	0	0	0	0	0	1	29
500	0	1	0	3	0	0	0	1	1	1	0	4	5	2	4	0	0	1	0	1	1	0	0	0	2	27
600	0	1	0	1	0	0	0	2	2	1	0	4	13	0	2	0	0	1	1	0	2	1	1	0	9	41
700	0	0	0	1	2	3	0	1	1	2	1	2	17	1	6	0	0	0	0	0	4	0	3	0	2	46
800	0	2	0	1	0	2	0	5	2	0	0	1	10	3	7	0	0	0	0	0	12	0	1	0	6	52
900	0	2	3	1	0	3	6	7	1	0	0	0	23	1	9	0	0	0	0	0	16	0	4	0	4	80
1000	3	7	1	0	3	3	3	7	0	0	0	2	15	1	9	6	0	0	0	0	7	1	1	0	3	72
1100	5	5	0	0	3	3	3	4	1	0	2	2	14	0	9	11	0	0	0	0	16	2	2	0	4	86
1200	4	1	1	0	0	3	2	0	1	1	1	3	11	0	16	11	0	0	0	0	4	0	1	0	4	64
1300	0	1	0	0	2	1	1	0	2	2	1	3	9	1	14	5	0	0	0	0	5	0	0	0	2	49
1400	0	0	2	0	0	1	0	0	1	2	1	1	14	0	8	1	0	0	0	0	5	1	0	0	5	42
1500	0	0	1	0	0	0	0	0	0	1	0	0	10	0	1	1	0	0	0	0	1	2	0	0	3	20
1600	0	0	2	0	0	0	0	0	0	2	4	0	11	0	1	3	0	0	0	0	1	3	0	0	2	29
1700	0	0	3	0	0	0	0	0	1	2	0	0	7	0	0	0	0	0	0	0	0	0	0	7	0	20
1800	0	0	4	0	0	0	0	0	0	1	0	2	6	0	0	0	0	0	0	0	1	0	0	3	0	17
1900	0	0	3	0	0	0	0	0	0	1	0	0	4	0	0	0	0	0	0	0	0	0	1	0	0	9
2000	0	0	2	0	0	0	0	0	0	0	0	1	3	0	1	0	0	0	0	0	0	0	0	1	0	8
2100	0	0	3	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	0	7
2200	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2300	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	3
2400	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	0
2500	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2600	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	0
2700	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
2800	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	0
2900	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	0
3000	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
TOPLAM	12	32	27	17	34	52	15	46	22	18	19	67	183	28	97	38	13	27	100	18	90	17	30	13	58	1073

Number of the existing AWSs in the basins

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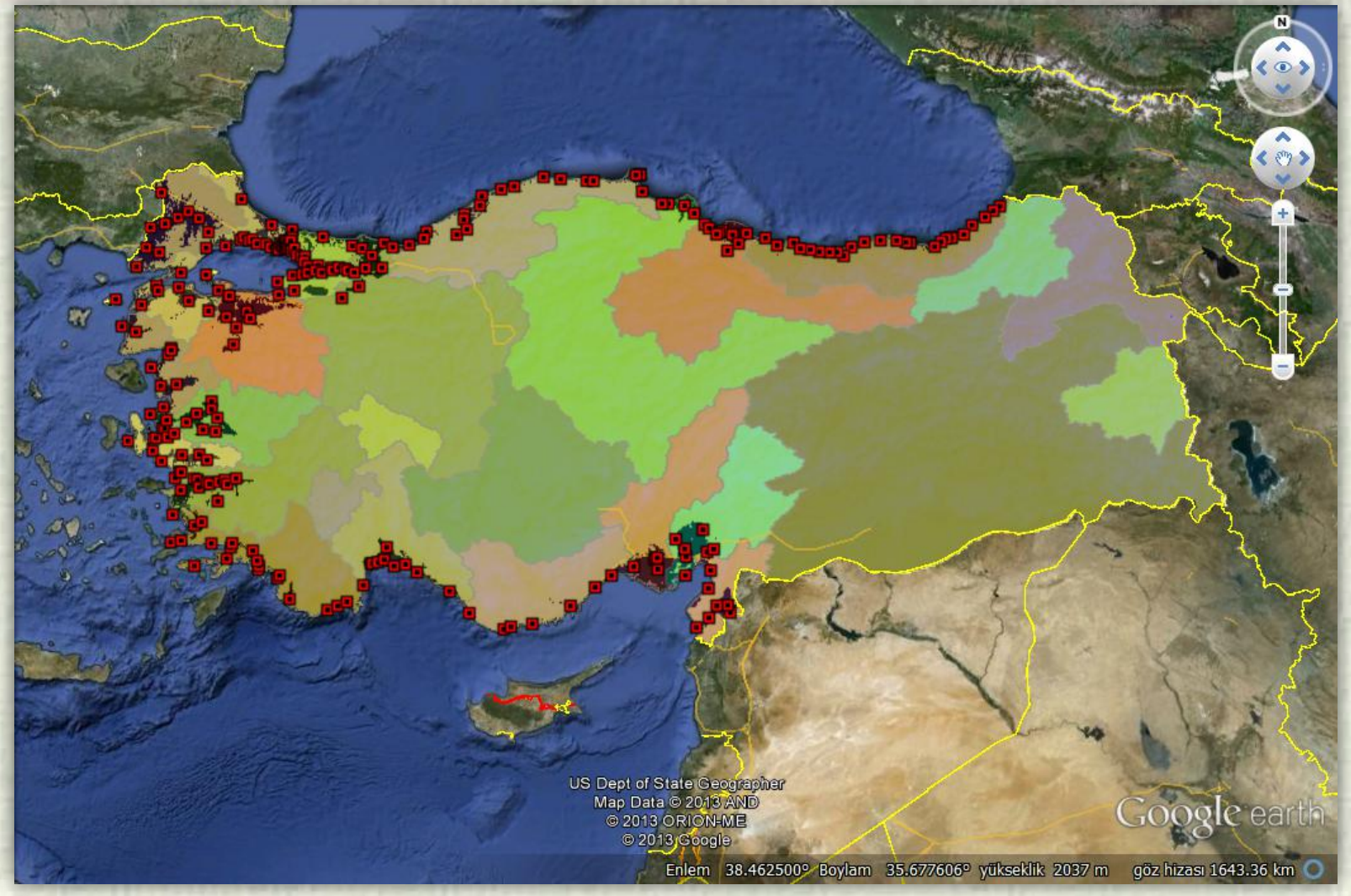
FUTURE PLAN



Distribution of the existing AWSs at 0-100 m height band in the basins

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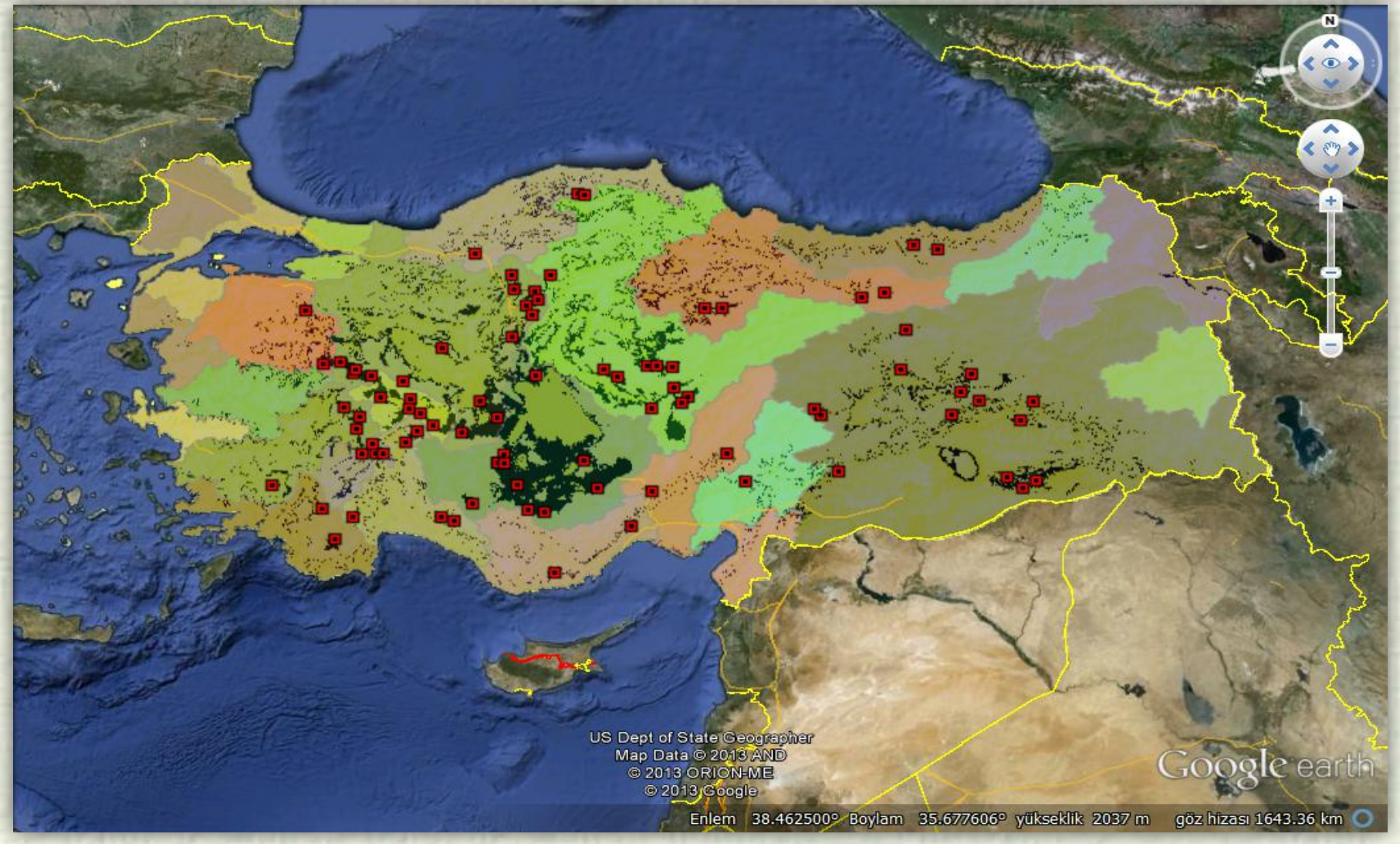
FUTURE PLAN

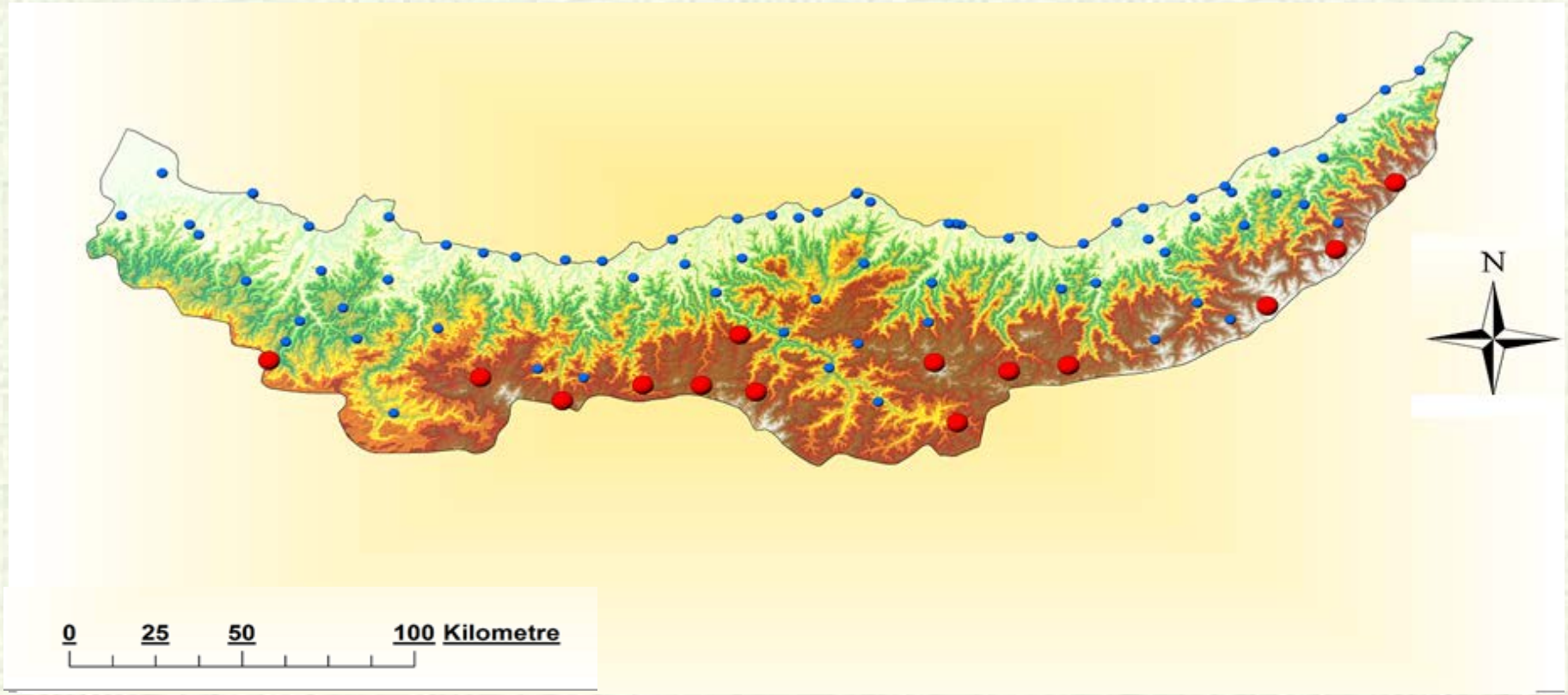
METEOROLOJİ



Distribution of the existing AWSs at 1000-1100 m height band in the basins

FUTURE PLAN

EASTERN BLACK SEA BASIN



THANK YOU
FOR YOUR ATTENTION