In the Name of GOD

بسم الله الرحمن الرحيم

International Conference
GLOBAL AND REGIONAL
CLIMATE CHANGES

16-19 November 2010
Kyiv, Ukraine

Review of Climate Change Over Iran

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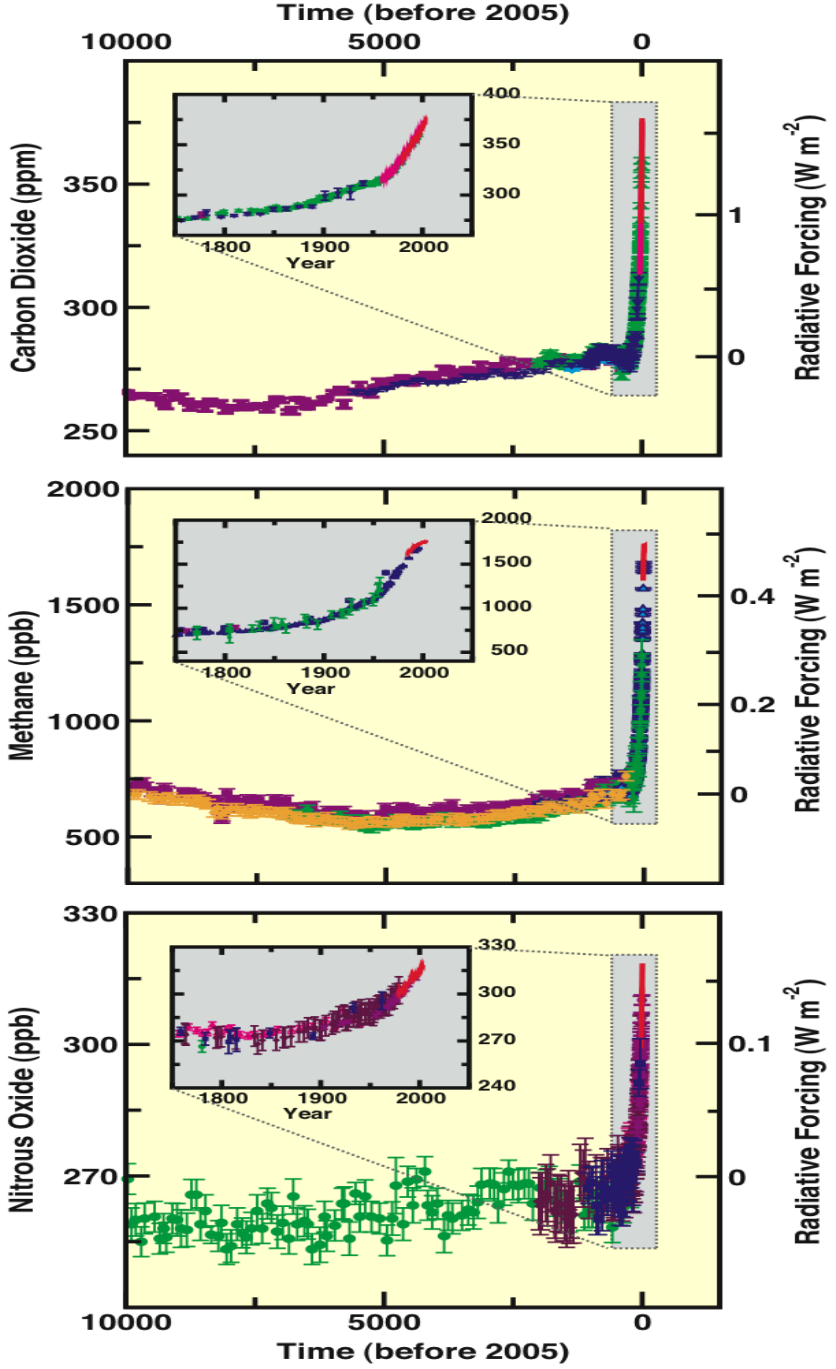
High Lights of Presentation

- Impacts of Climate Variation (Emphasize on Dust Storm)
- Climate Trend and Variation over Iran
- Next Steps

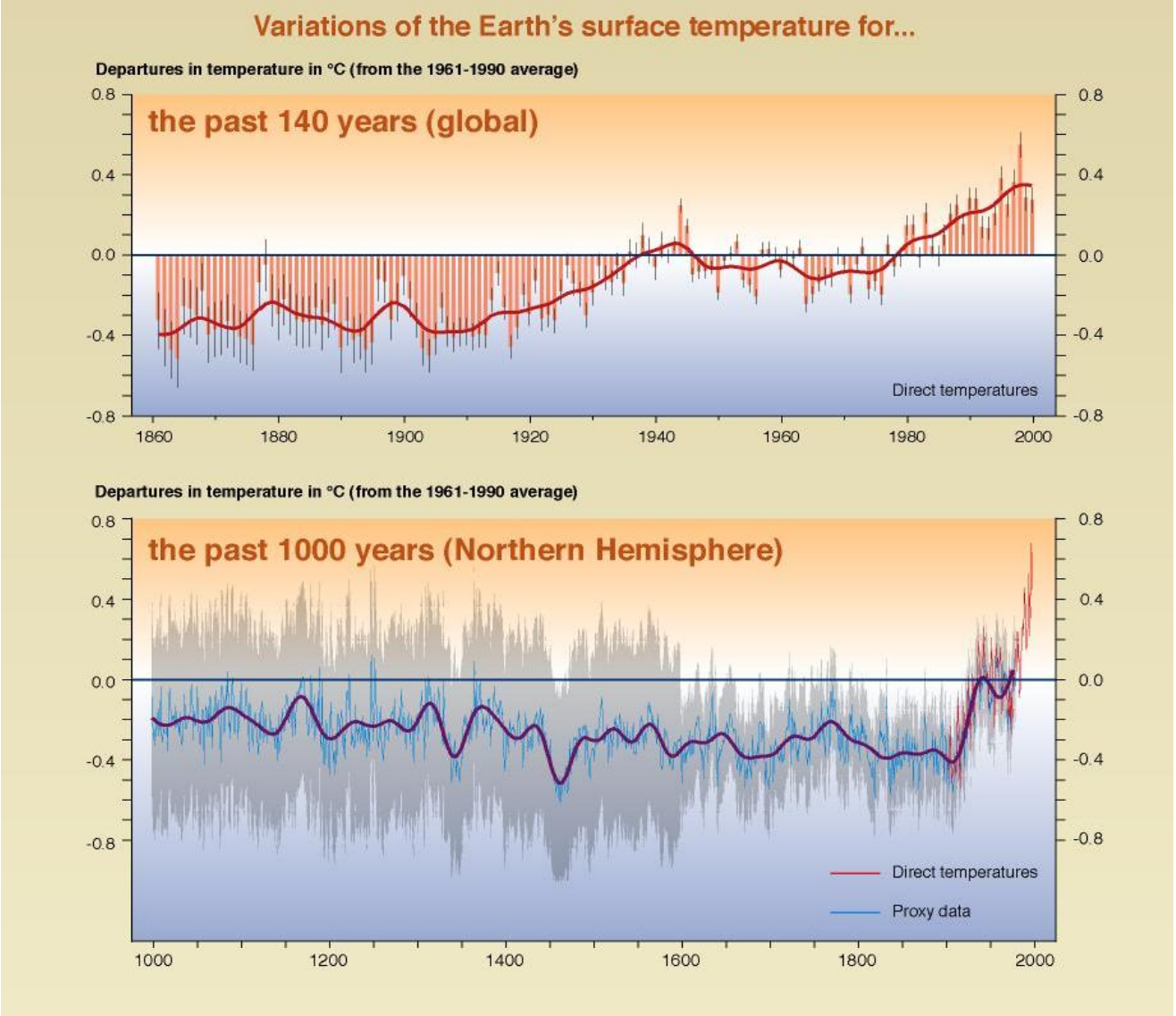
Humanity's Top Ten Problems Next 50 Years

1. ENERGY
2. WATER
3. FOOD
4. ENVIRONMENT
5. POVERTY
6. TERRORISM & WAR
7. DISEASE
8. EDUCATION
9. DEMOCRACY
10. POPULATION

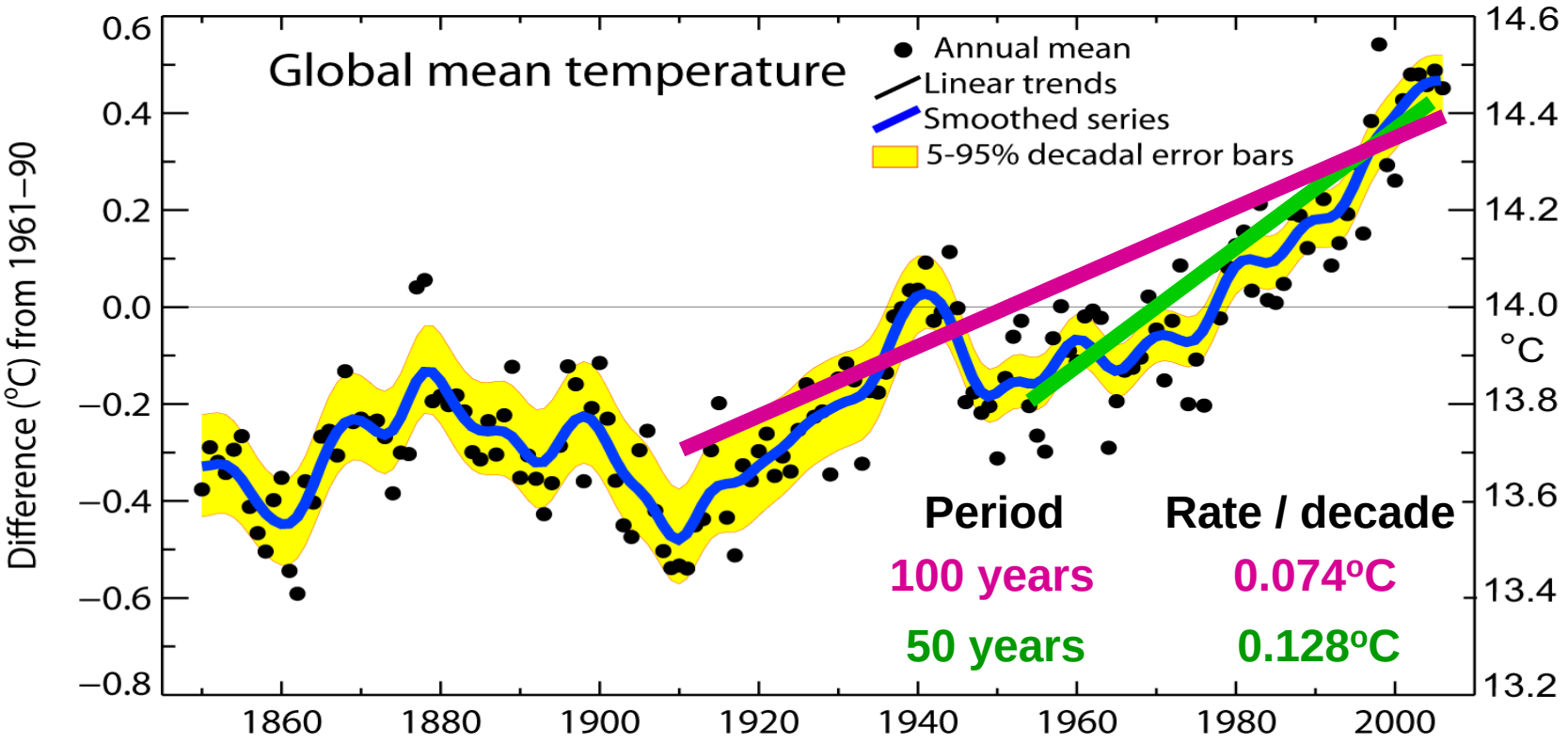
Greenhouse Gases Variations Due to Humane Activities



Global Mean Surface Temperatures have Increased



Changes in global average surface temperature



Eleven of the last twelve years rank among the twelve warmest years in the instrumental record of global surface temperature

Effects of Global Warming

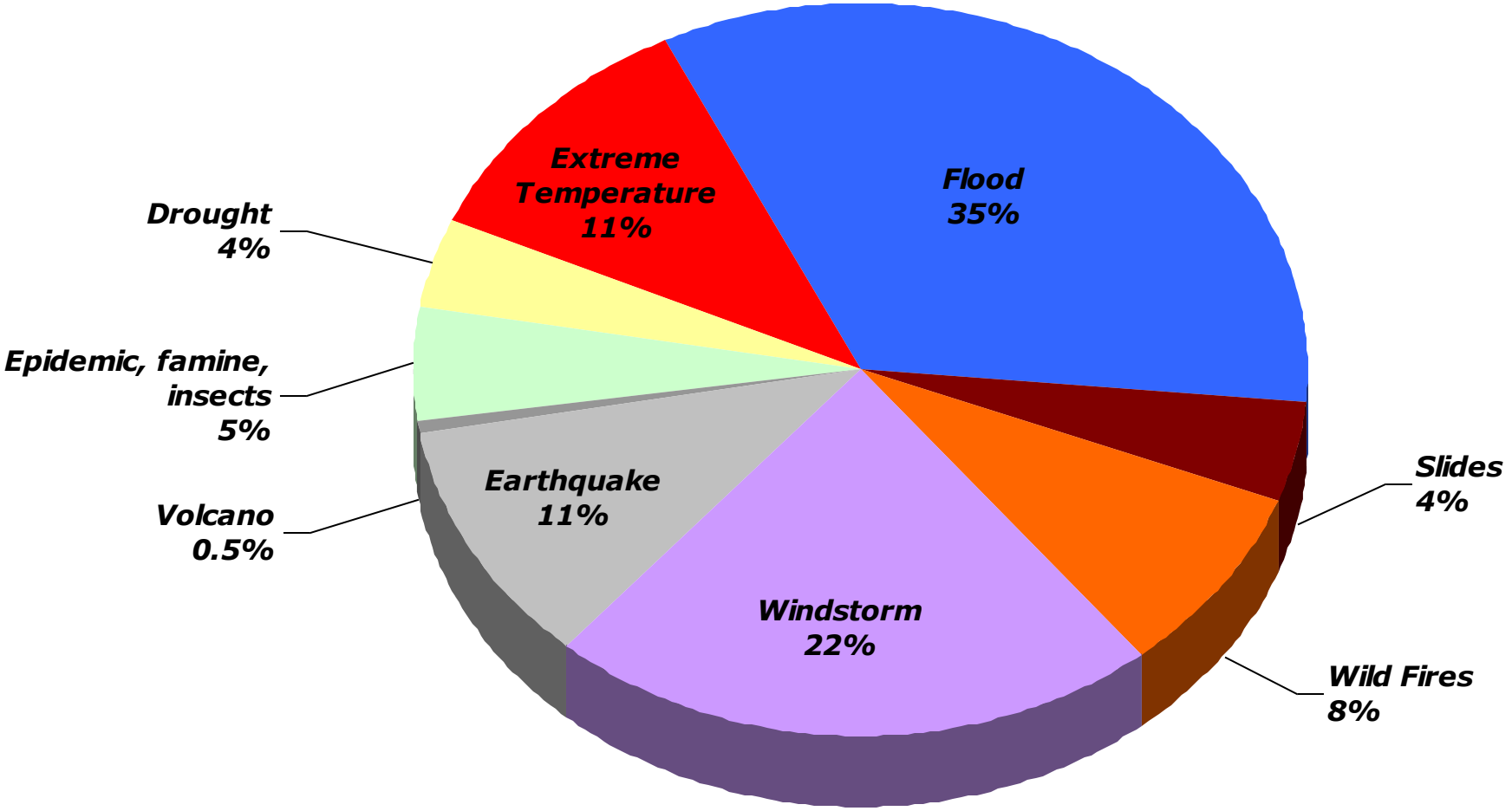
Climatic and Environmental Extreme Events Over Iran

Might be Due to Impacts of Climate Change Or Climate Fluctuation

- Human-induced climate change is expected to lead to an intensification of the hydrological cycle causing a higher frequency and severity of these extreme events

Number of Disasters

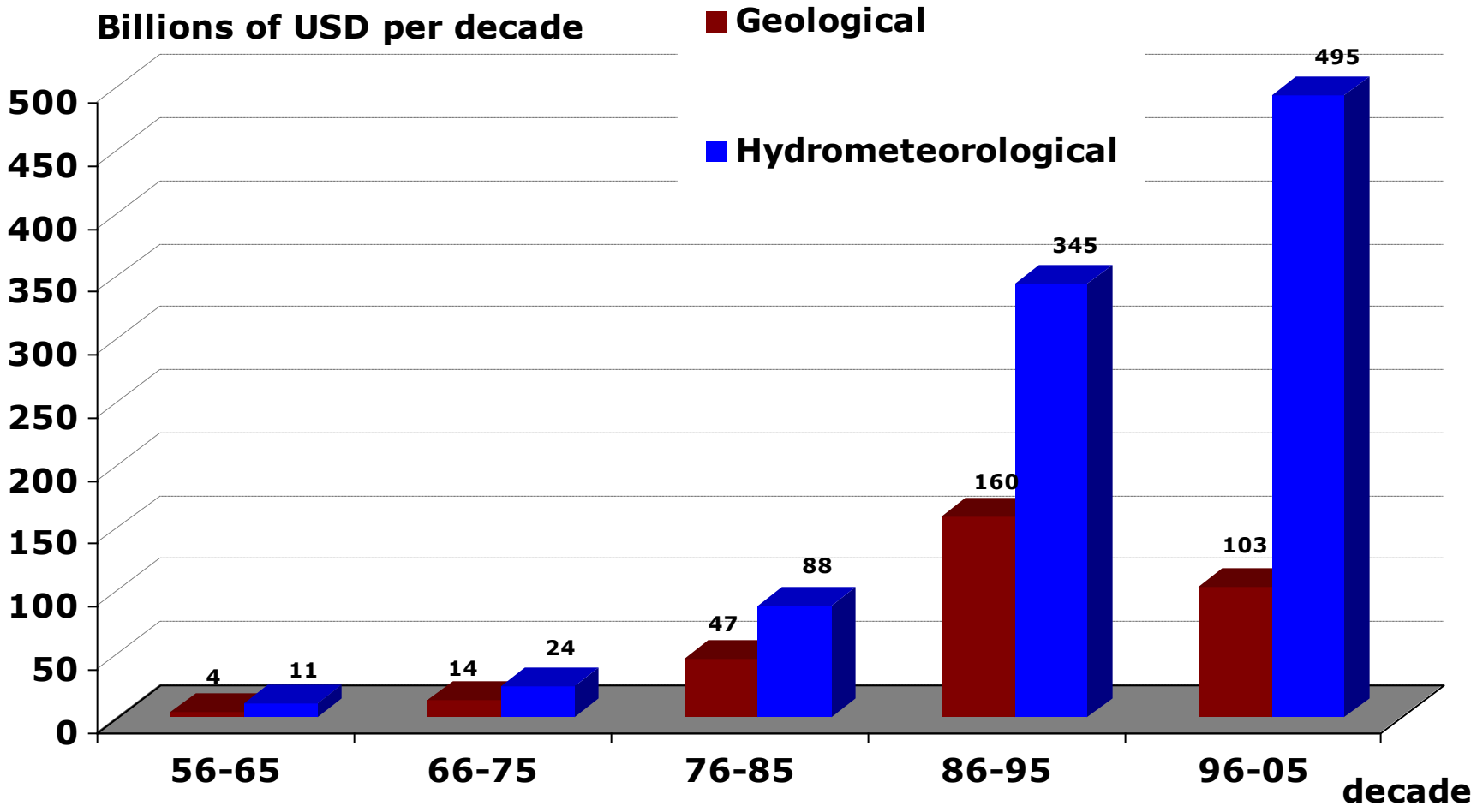
(Global, 1980-2005)



Nearly 90% of disasters are related to hydro-meteorological factors.

Source: EM-DAT

Economic Losses Related to Disasters are on the Way Up !

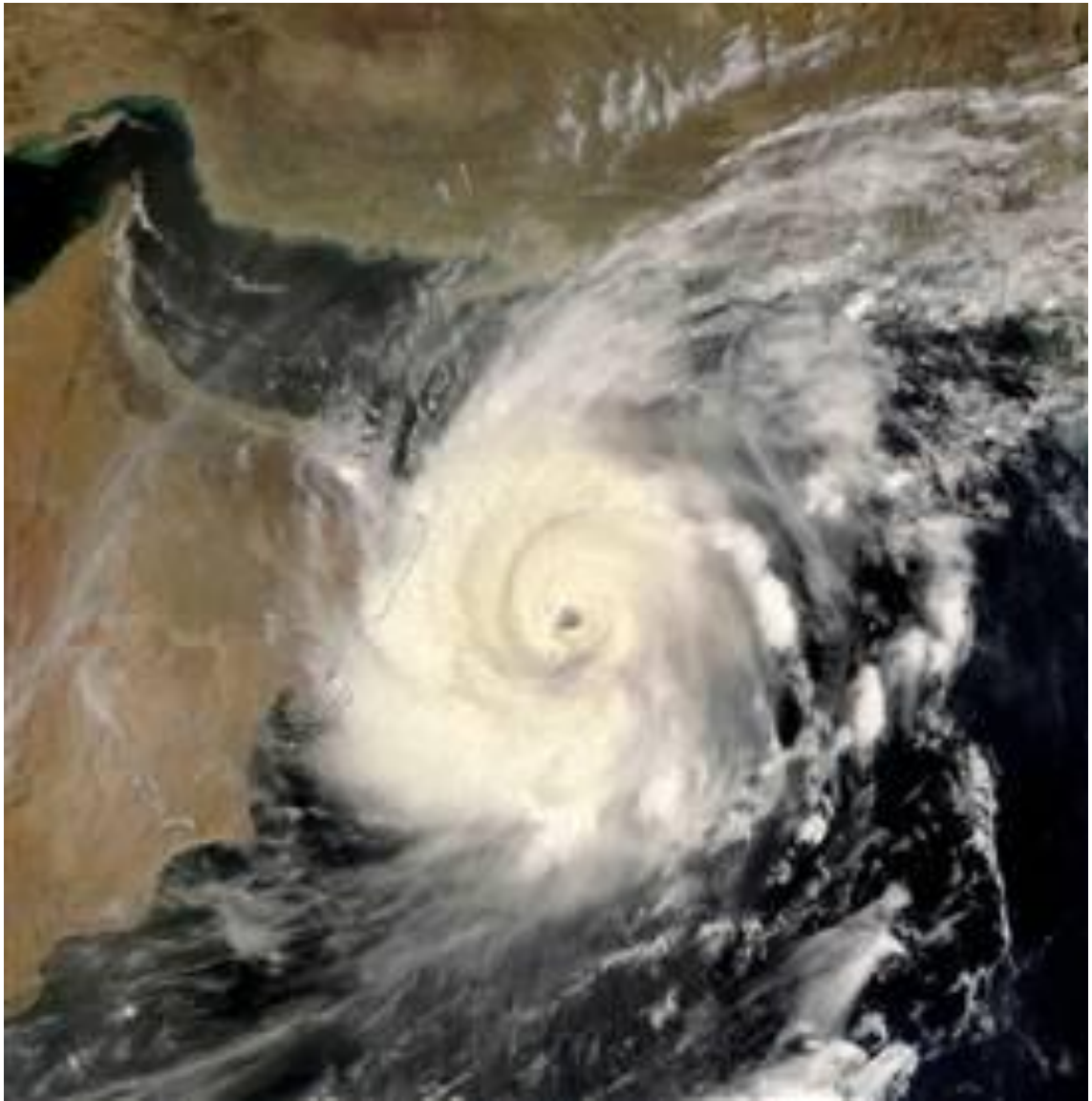


Source: EM-DAT

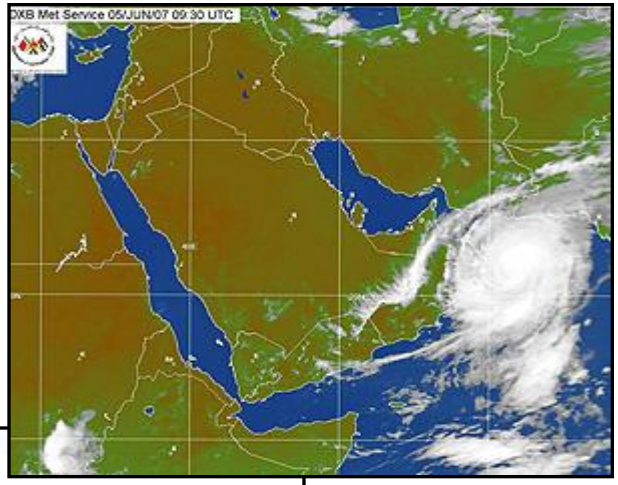
Unexpected and Unusual Severe Winter in 2007 and Might be also for 2010

Unexpected and unusual severe winter in 2007

Super Cyclonic Storm Gonu



Super Cyclonic Storm Gonu



Gholestan Province Flood

Extreme periods of continuous droughts

Extreme periods of continuous droughts

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Dust Storm

Dust Storm
as Regional Extreme Event

Kermanshah - West of Iran

PM10 = 2100 µg/m3
04-07-2009

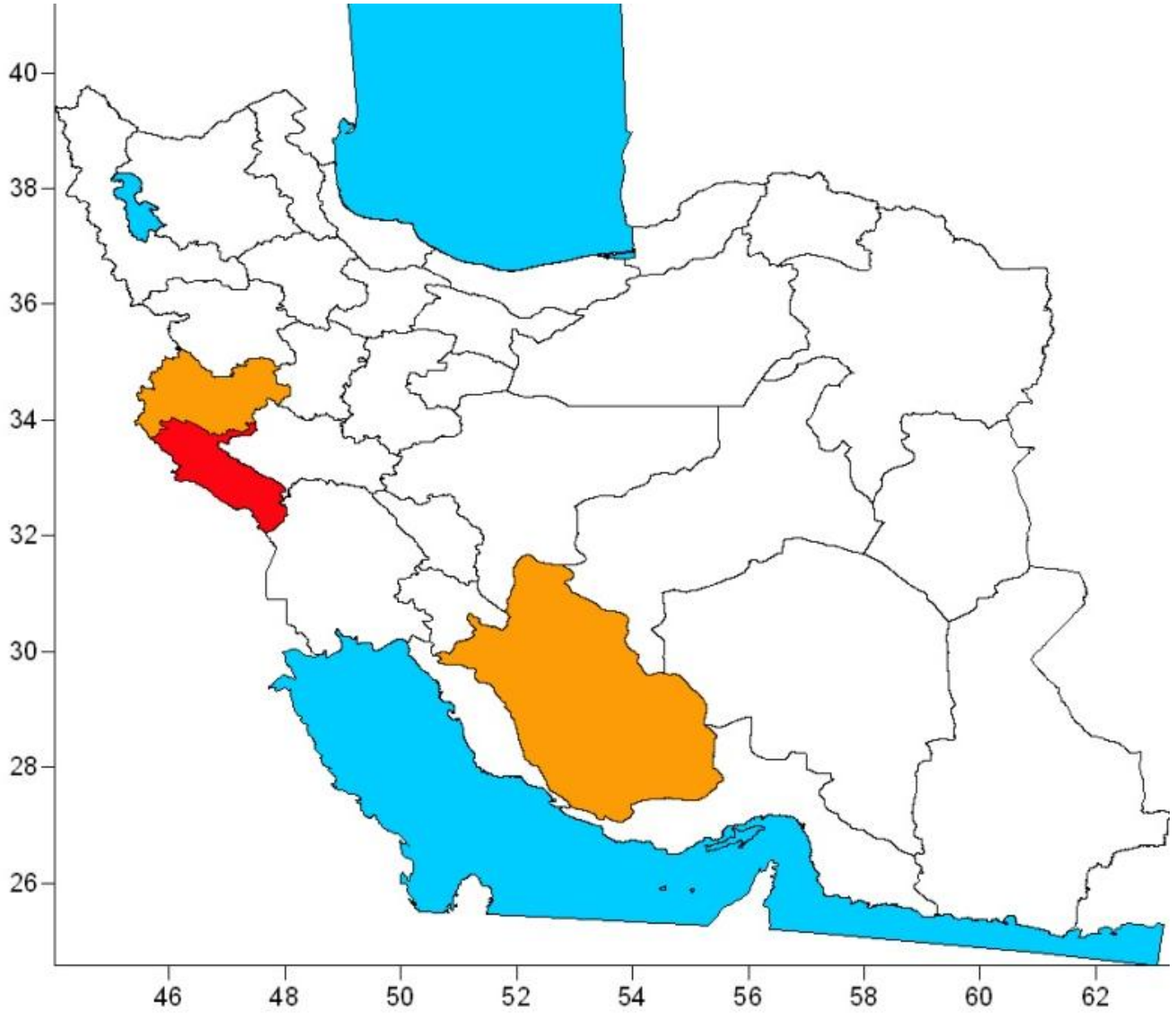
PM10 = 90 µg/m3
14-10-2009

Dust Storm in Booshehr South of Iran

Impact of dust on health and sanitation

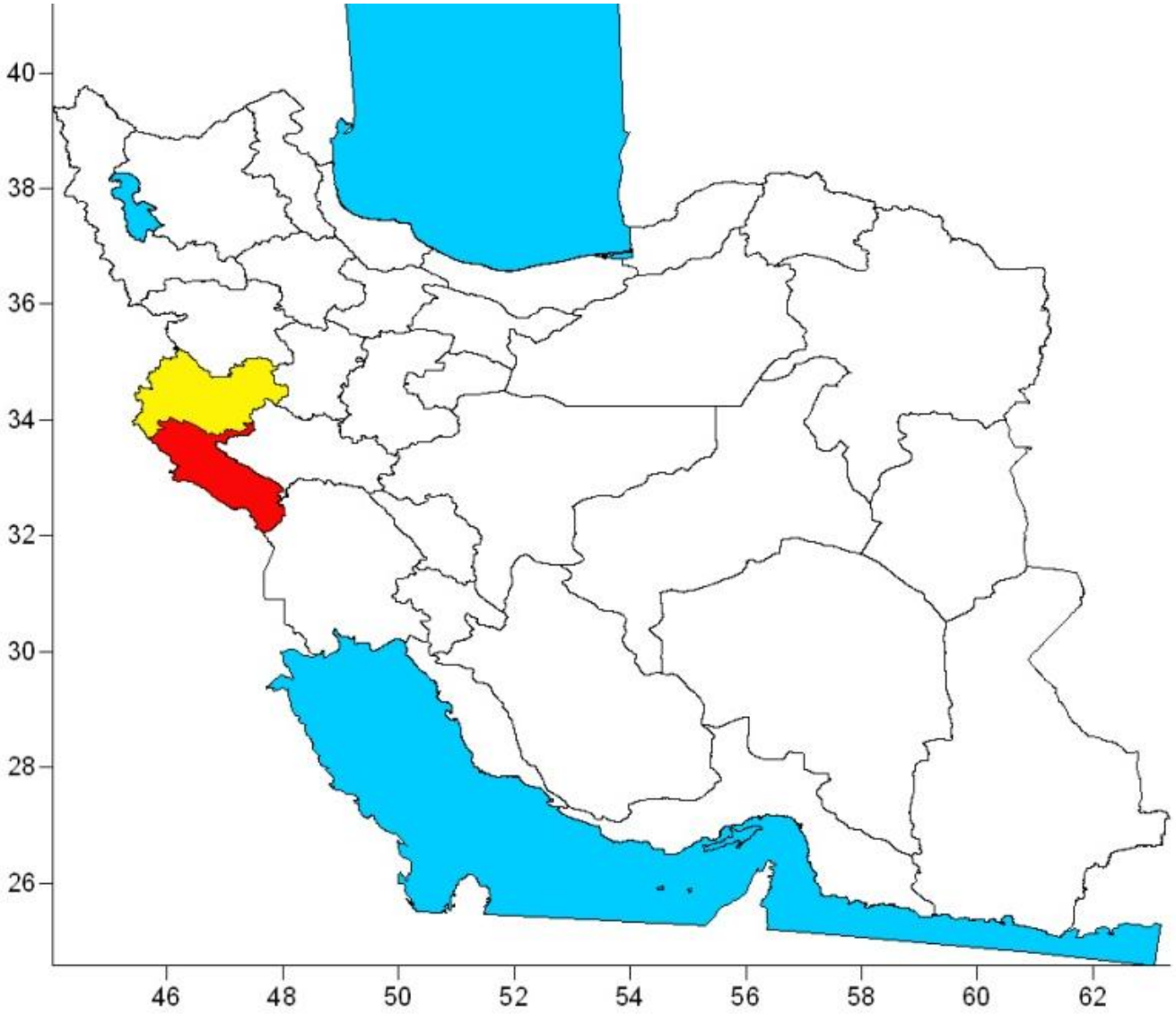
- **Increase of kids, adult &devotee health risk**
- **Increase patient reference to hospitals from 20% to 60%**

Maximum Concentration of Dust (µ gr/m3) in Critical Provinces of Iran - 2005



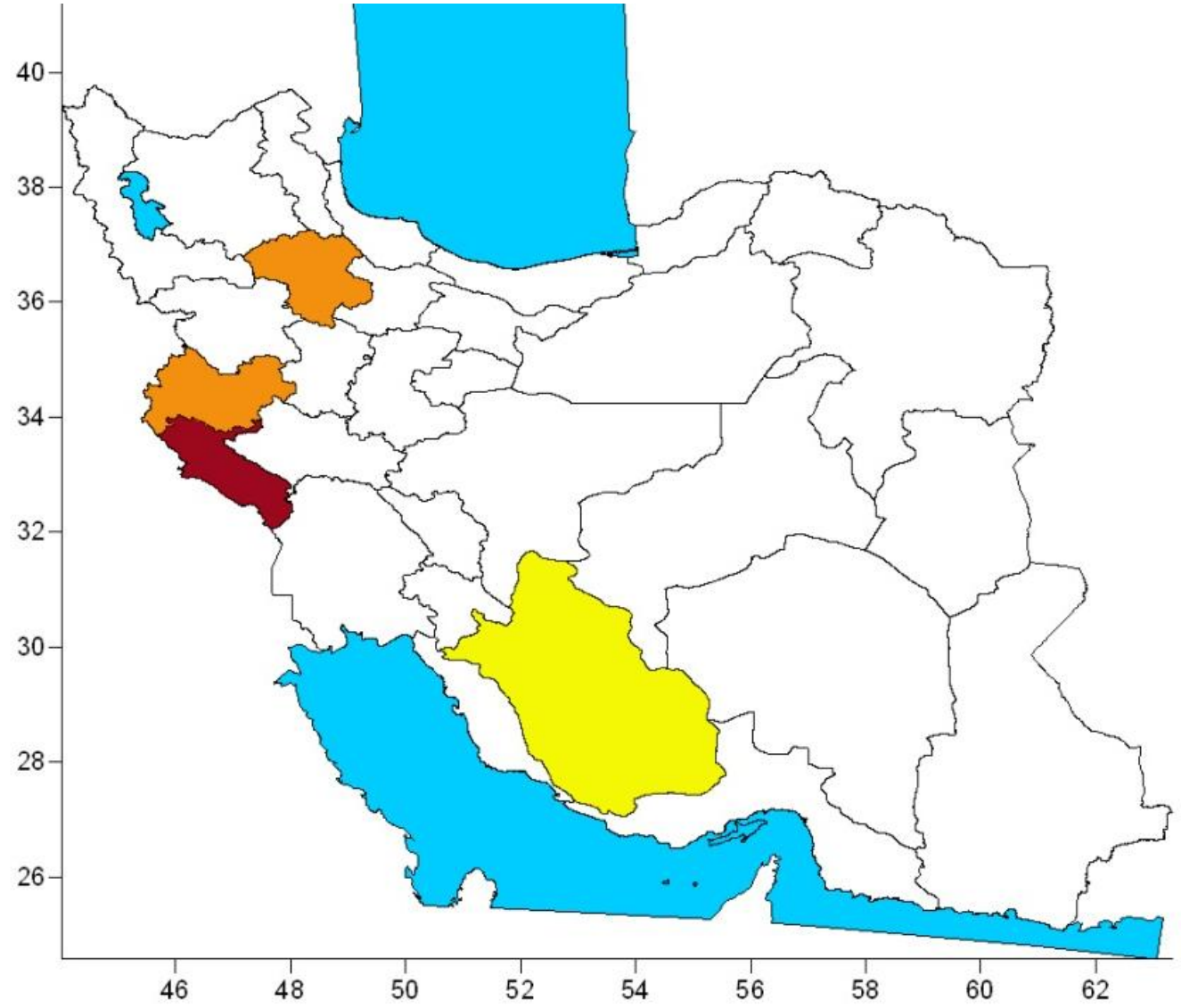
Concentration (µ gr/m3)
>3000
2001 - 3000
501 - 2000
150 - 500
<150

Maximum Concentration of Dust (µ gr/m3) in Critical Provinces of Iran - 2006



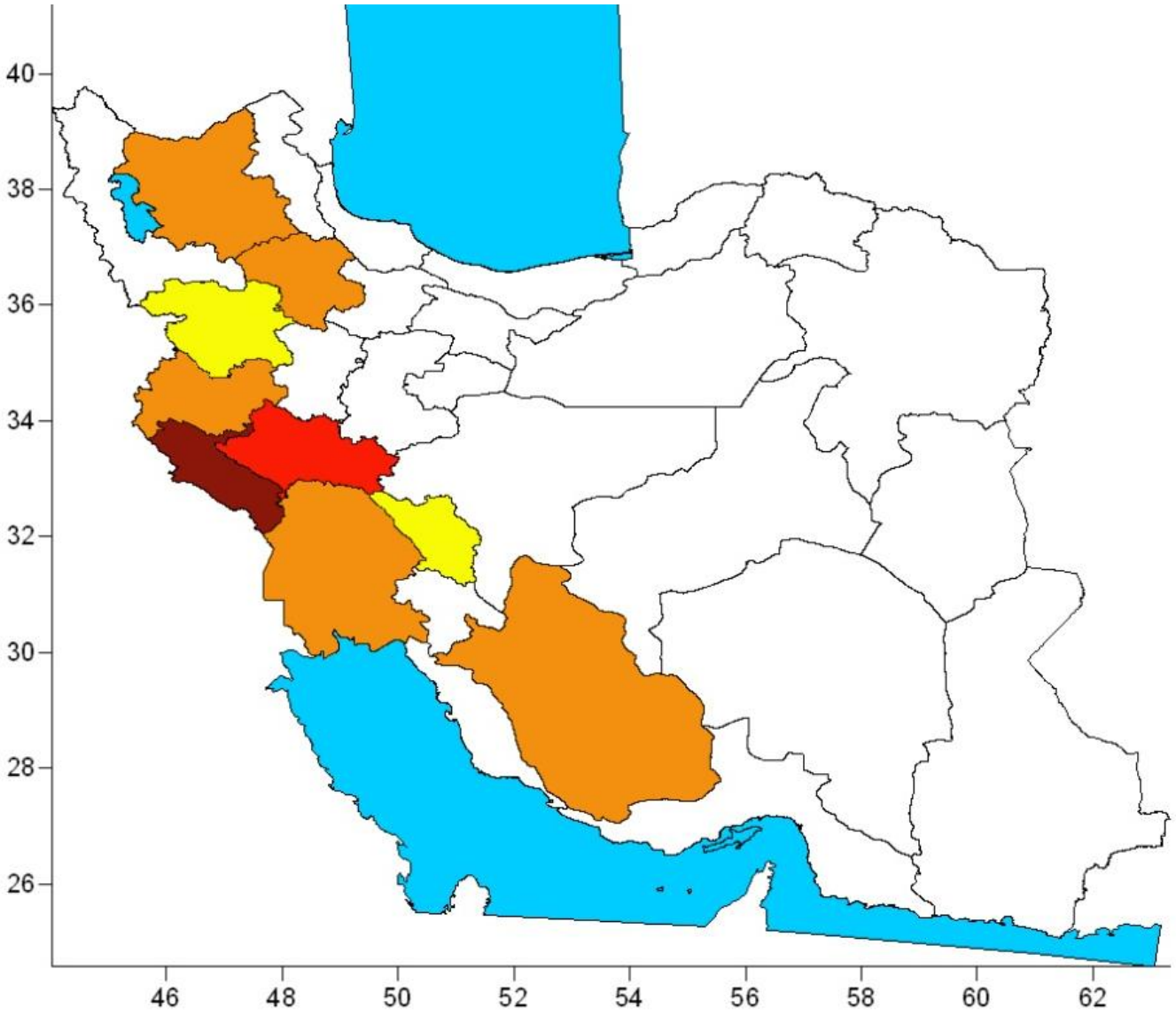
Concentration (µ gr/m3)
>3000
2001 - 3000
501 - 2000
150 - 500
<150

Maximum Concentration of Dust (µ gr/m3) in Critical Provinces of Iran - 2007



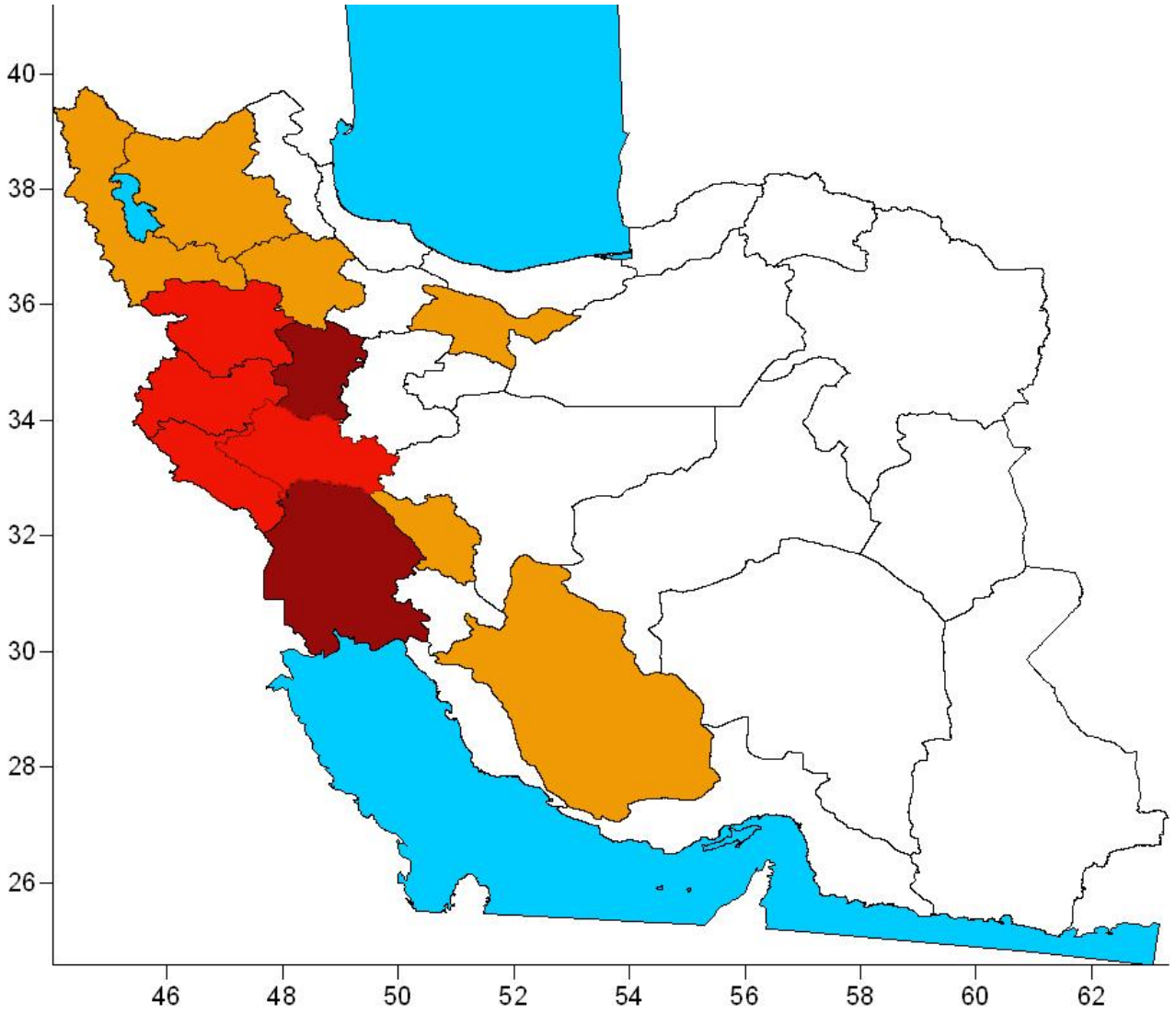
Concentration (µ gr/m3)
>3000
2001 - 3000
501 - 2000
150 - 500
<150

Maximum Concentration of Dust (µ gr/m3) in Critical Provinces of Iran - 2008



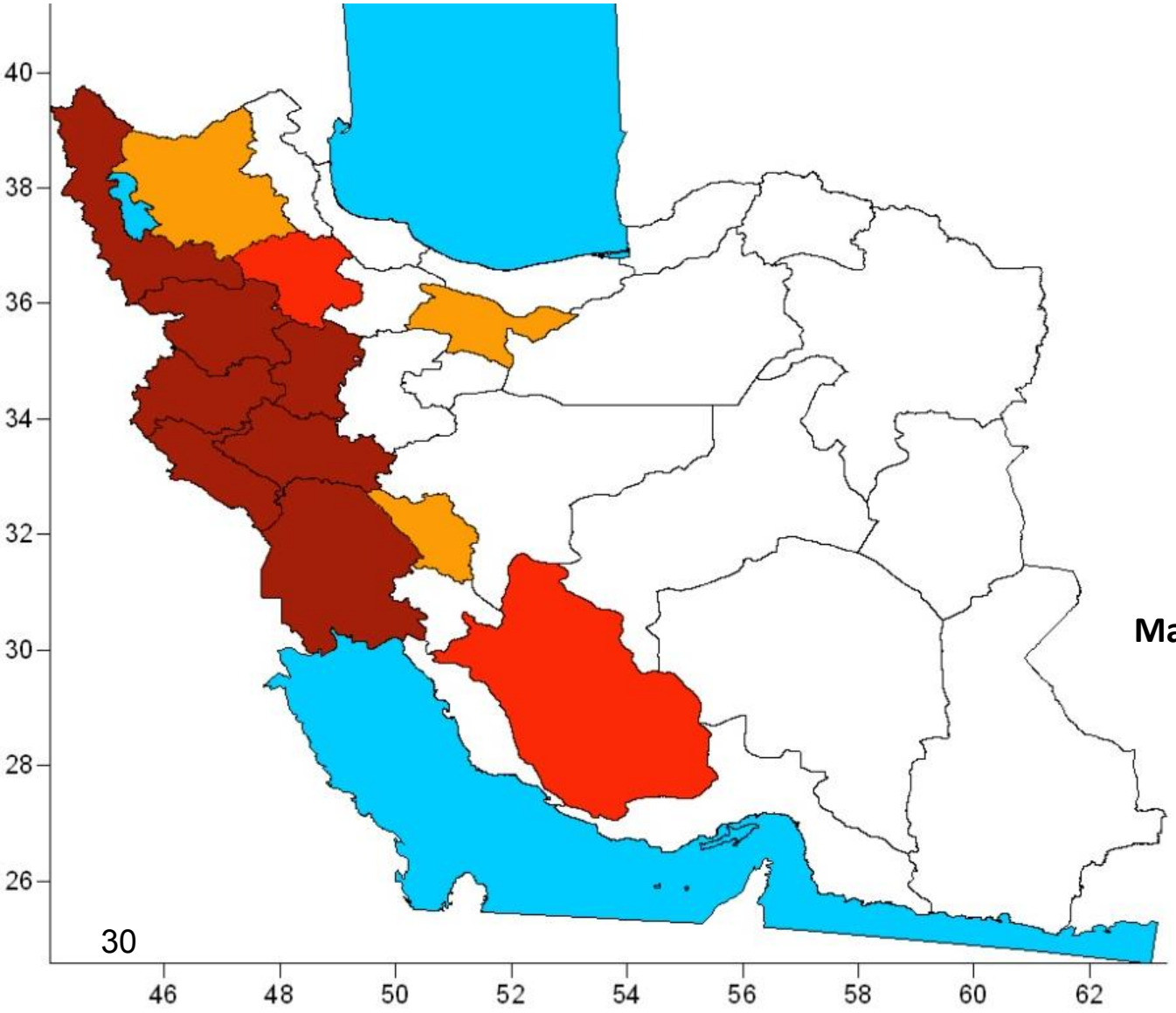
Concentration (µ gr/m3)
>3000
2001 - 3000
501 - 2000
150 - 500
<150

Maximum Concentration of Dust (µ gr/m3) in Critical Provinces of Iran - 2009



Concentration (µ gr/m3)
>3000
2001 - 3000
501 - 2000
150 - 500
<150

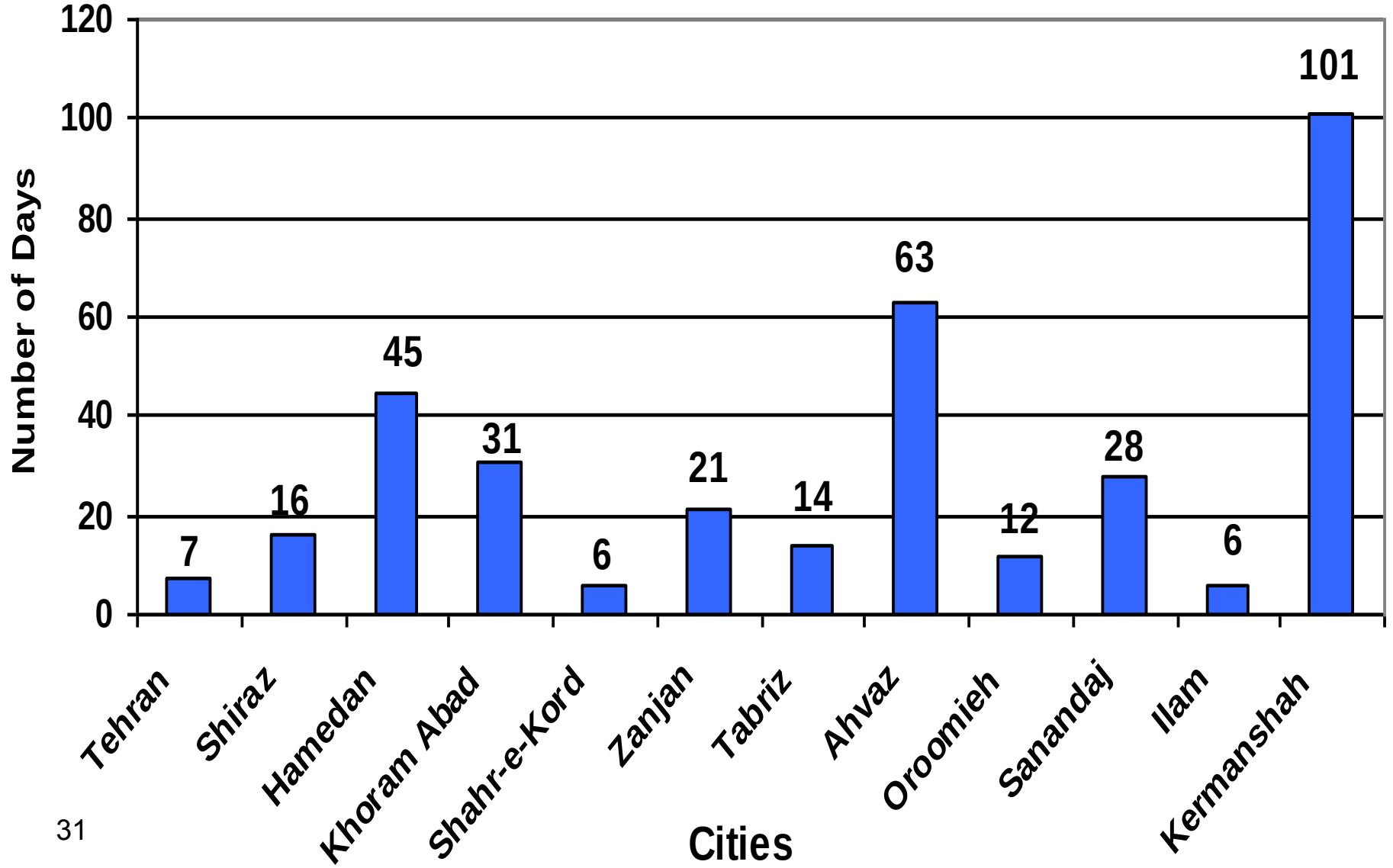
Deviation (%) on Dust Maximum Concentration With Limit of Standard in Critical Provinces of Iran (2009)



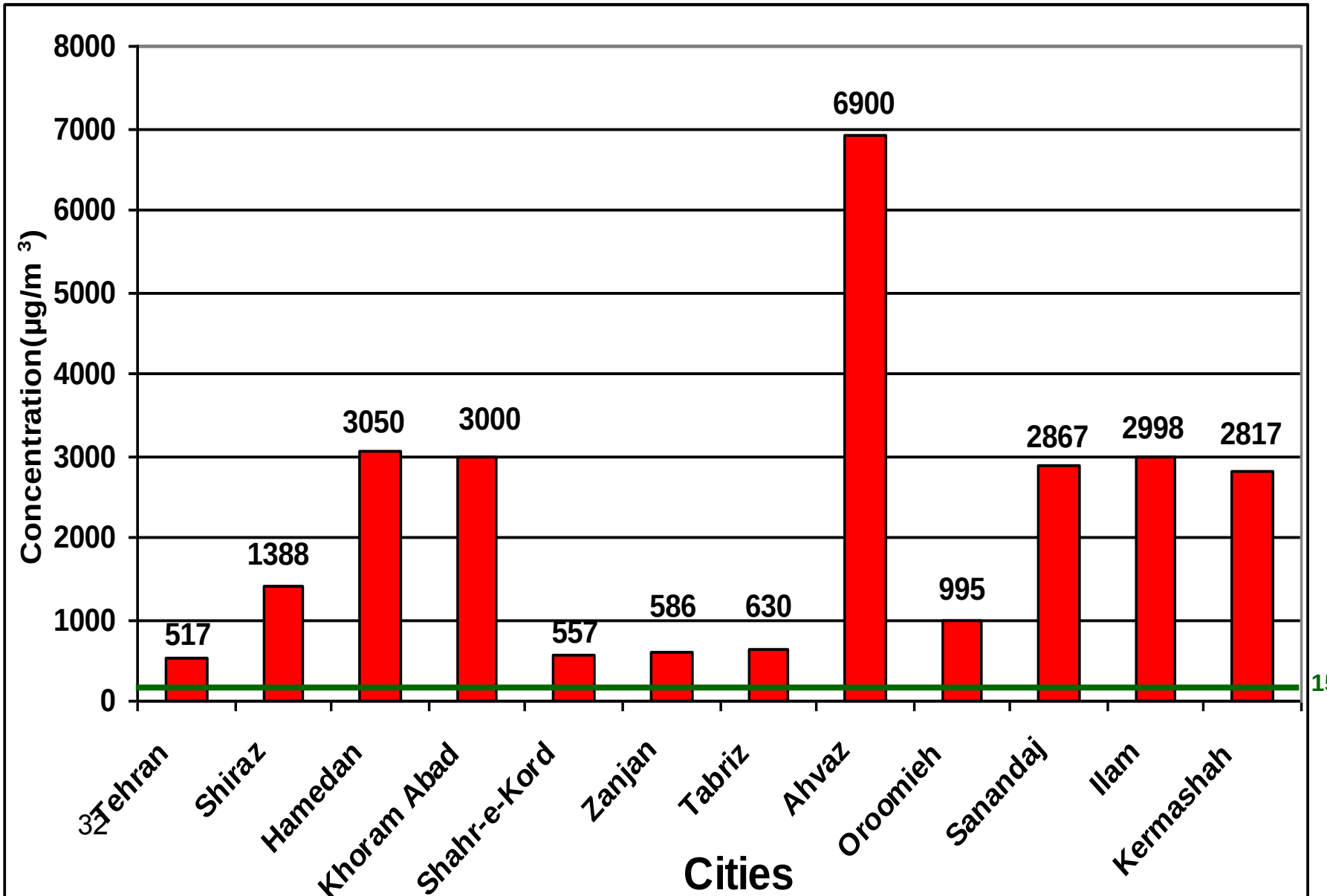
Deviation %
>1000
501 - 1000
101 - 500
1 - 100
0 & < 0

Limit of Standard for Maximum Concentration = 150

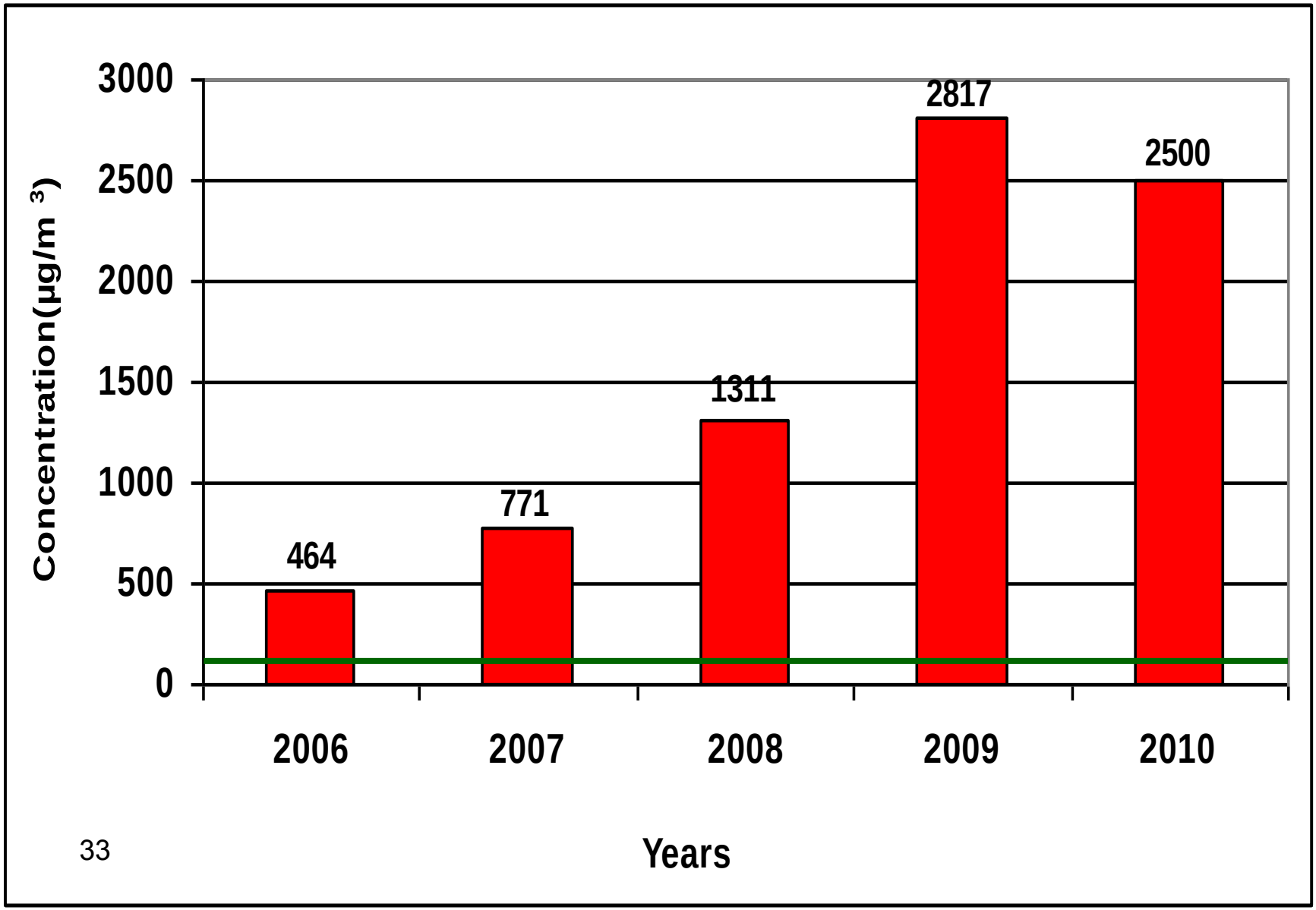
Dust Phenomenon Occurrence Days Number in Different Cities in 2009

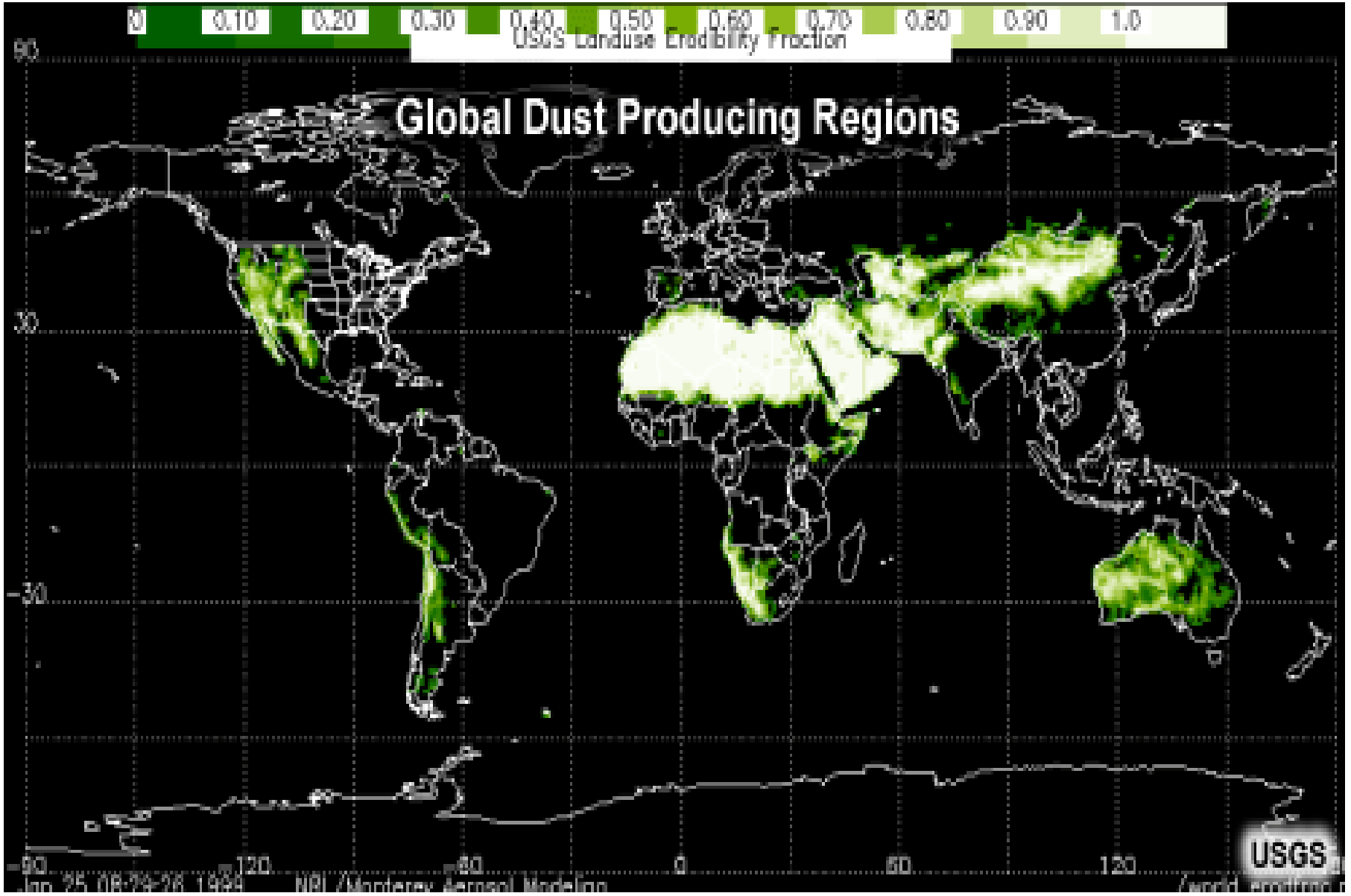


Maximum Dust Concentration in different cities in 2009

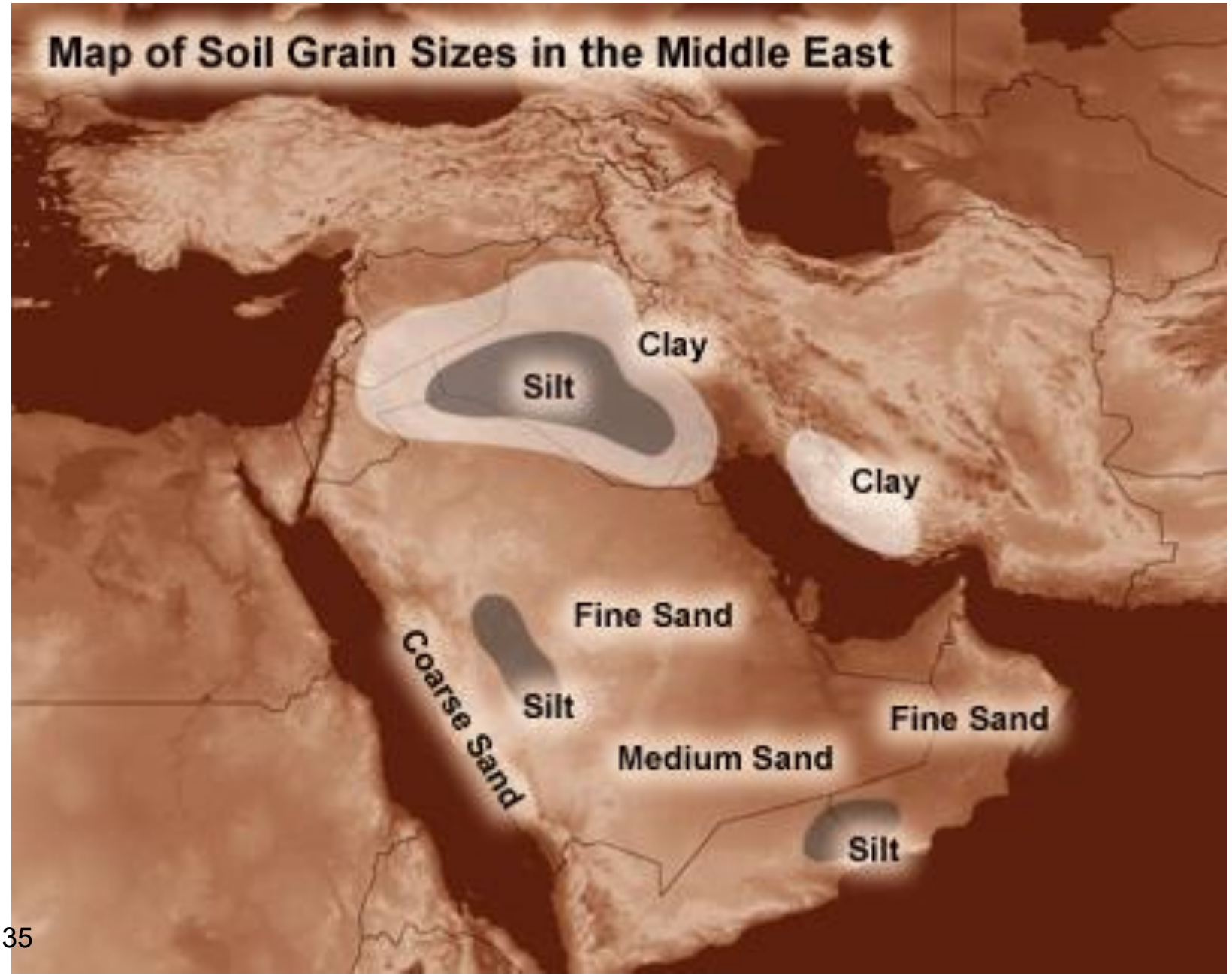


Maximum Dust Concentration in Kermanshah

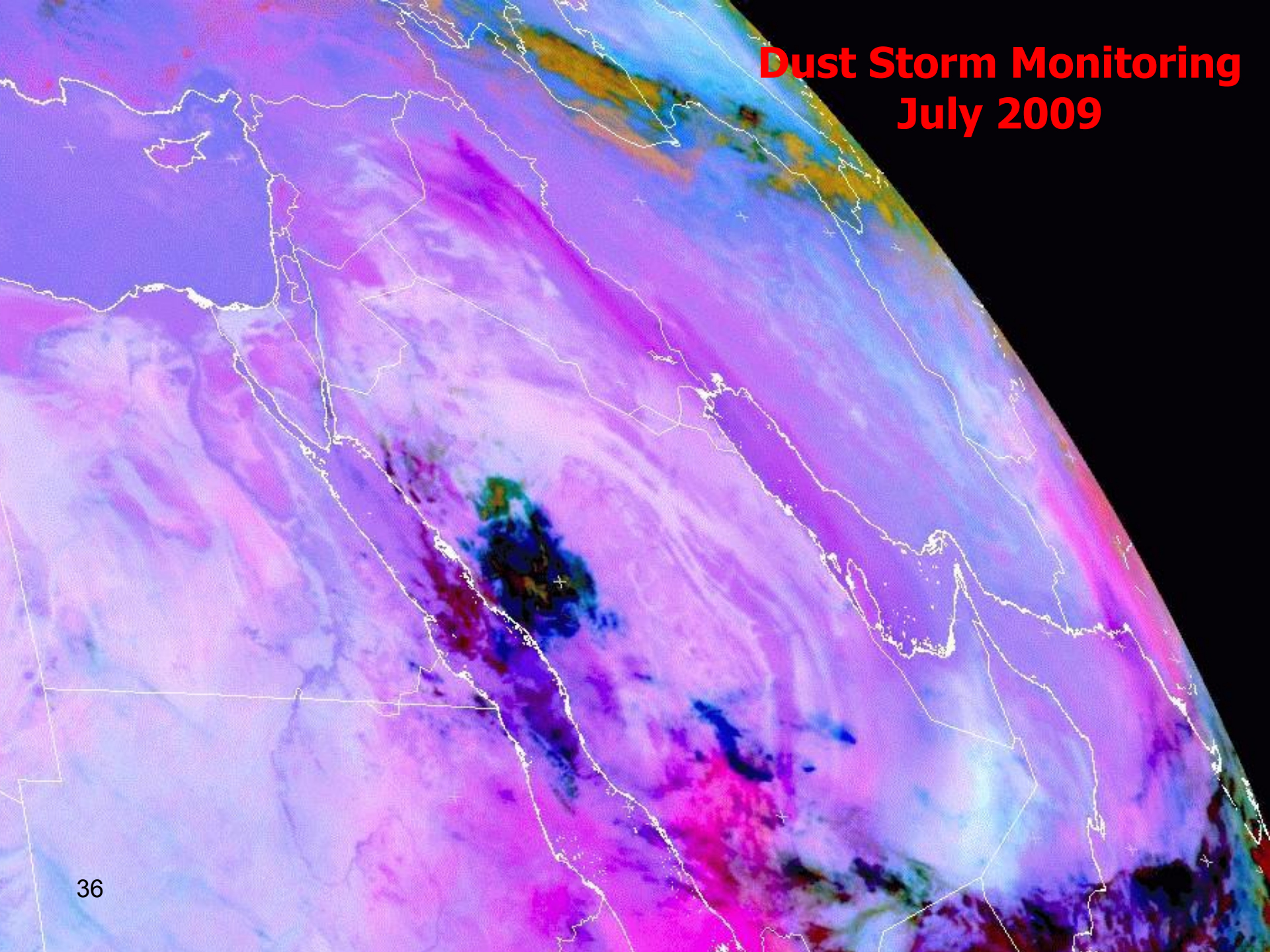


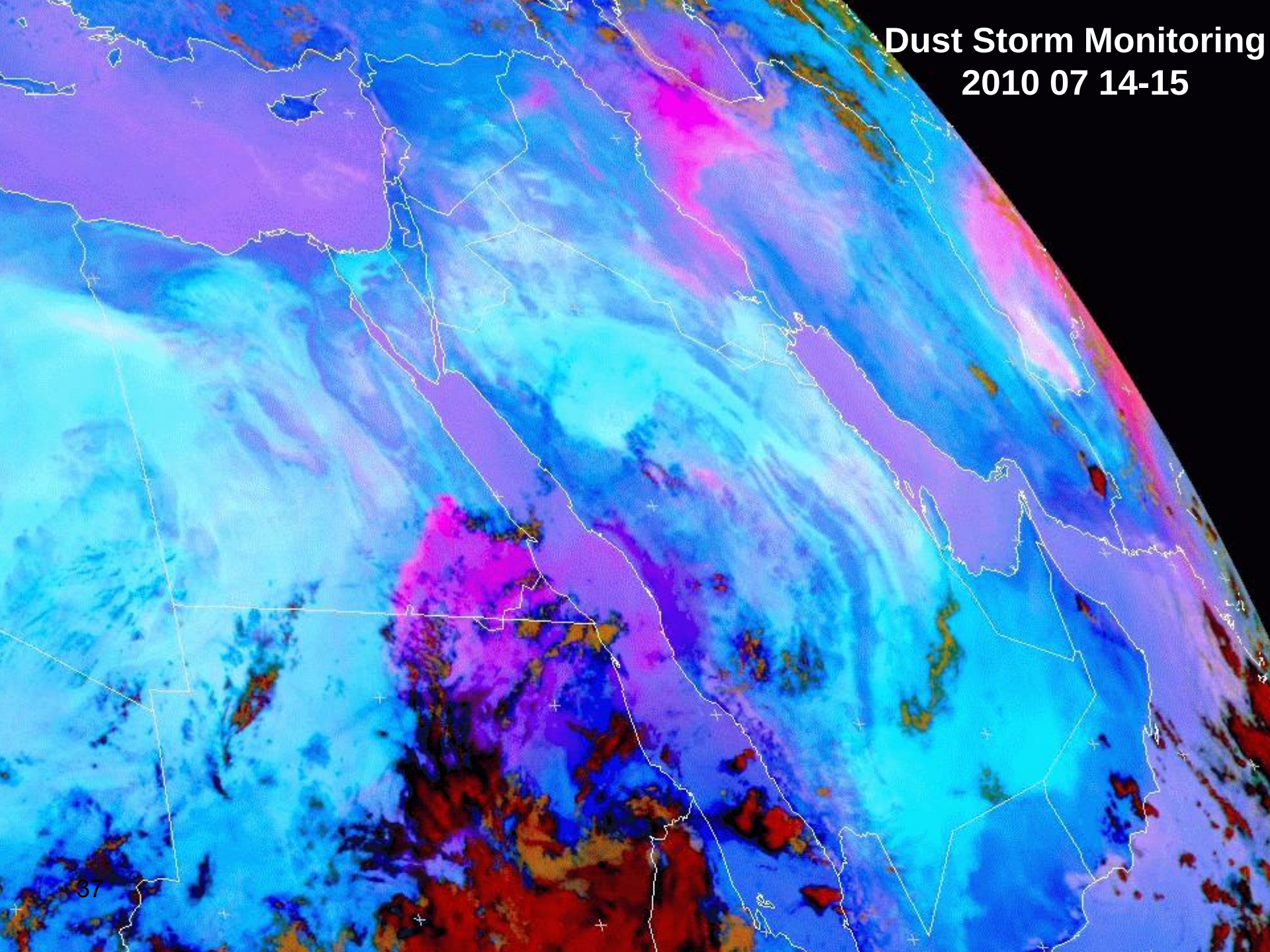

0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.0
USGS Landuse Erodibility Fraction
Global Dust Producing Regions
90
30
-30
-90
120
60
0
60
120
USGS

34


Map of Soil Grain Sizes in the Middle East
Clay
Silt
Clay
Fine Sand
Coarse Sand
Silt
Fine Sand
Medium Sand
Silt

35


Dust Storm Monitoring
July 2009


Dust Storm Monitoring
2010 07 14-15

INVSTIGATION OF CLIMATE VARIABILITY TREND IN I. R. OF IRAN

Examine Climatic Annual and Seasonal Variability and Trend over I. R. of Iran during 50 years period.

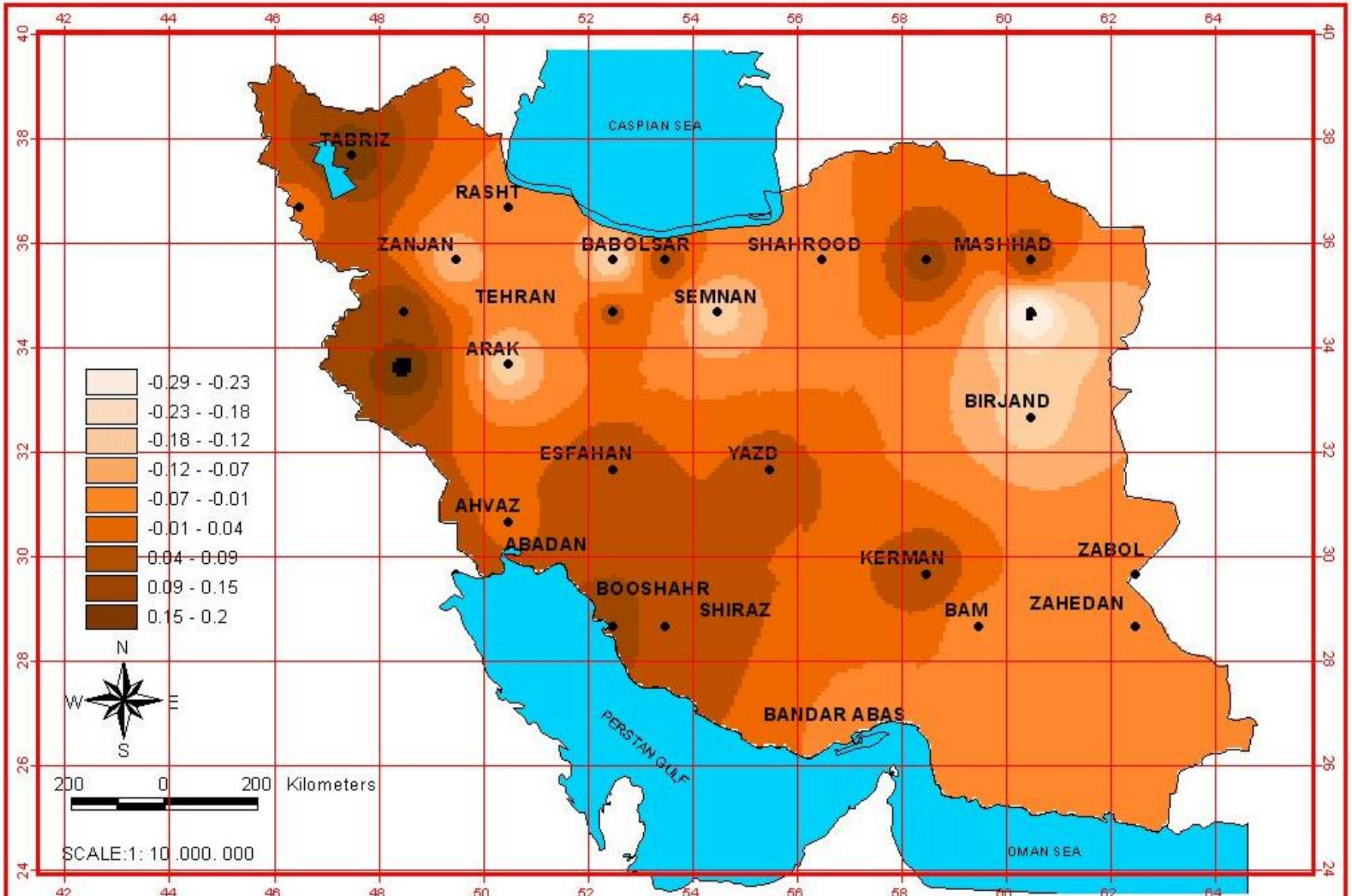
1. **Temperature (Mean, Minimum, and Maximum),**
2. **Precipitation,**
3. **Relative humidity,**
4. **Surface pressure**

The needed seasonal and annual data were extracted from the Iran National Climate Database maintained by the I. R. of Iran Meteorological Organization (IRIMO.

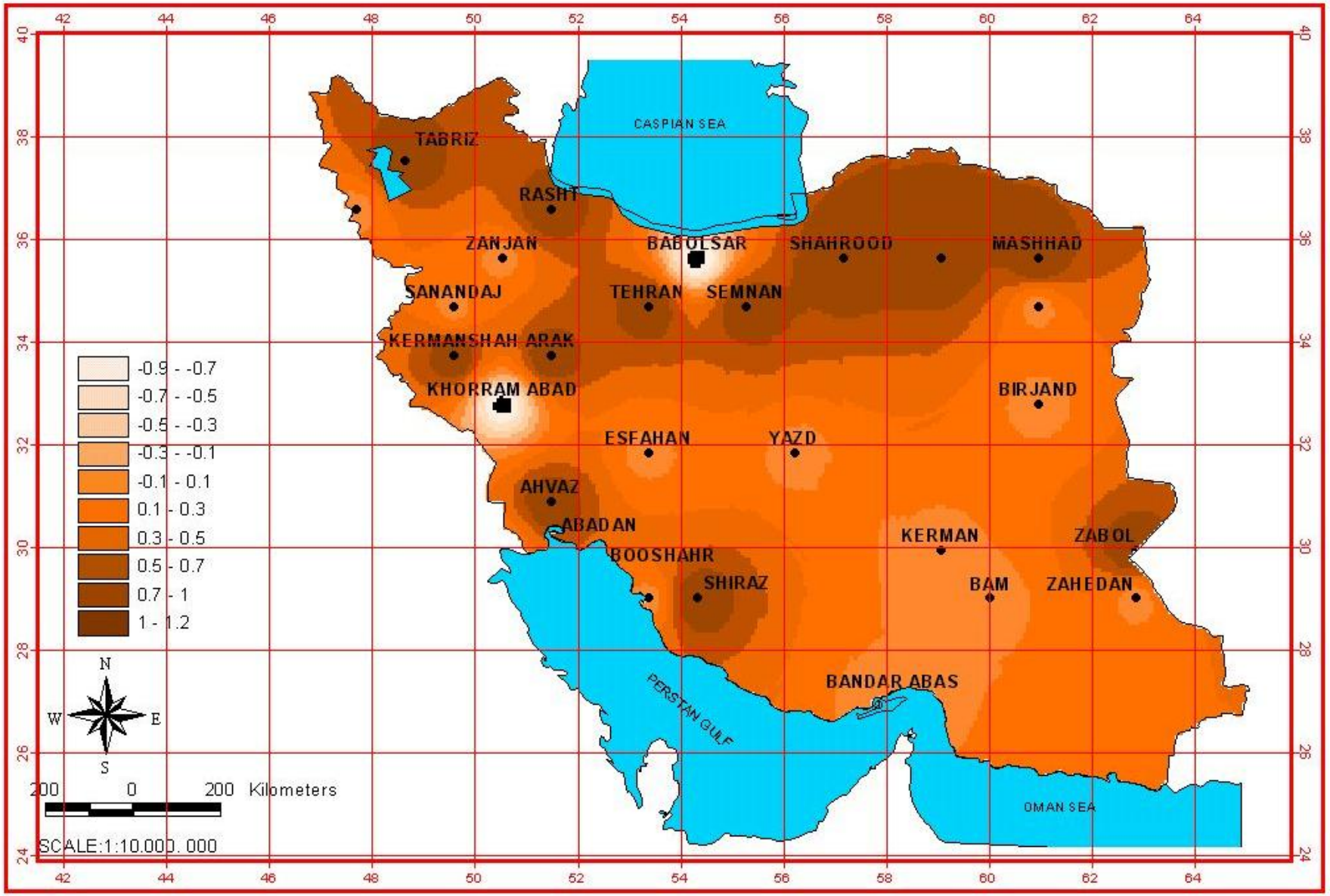
The indices were derived from data from 40 Synoptic Stations and were analyzed over the 1950-2000 period.

Different statistical methods were applied in order to analyze the temporal and spatial variability of data on annual and seasonal basis. The linear trends were computed and its significance was tested.

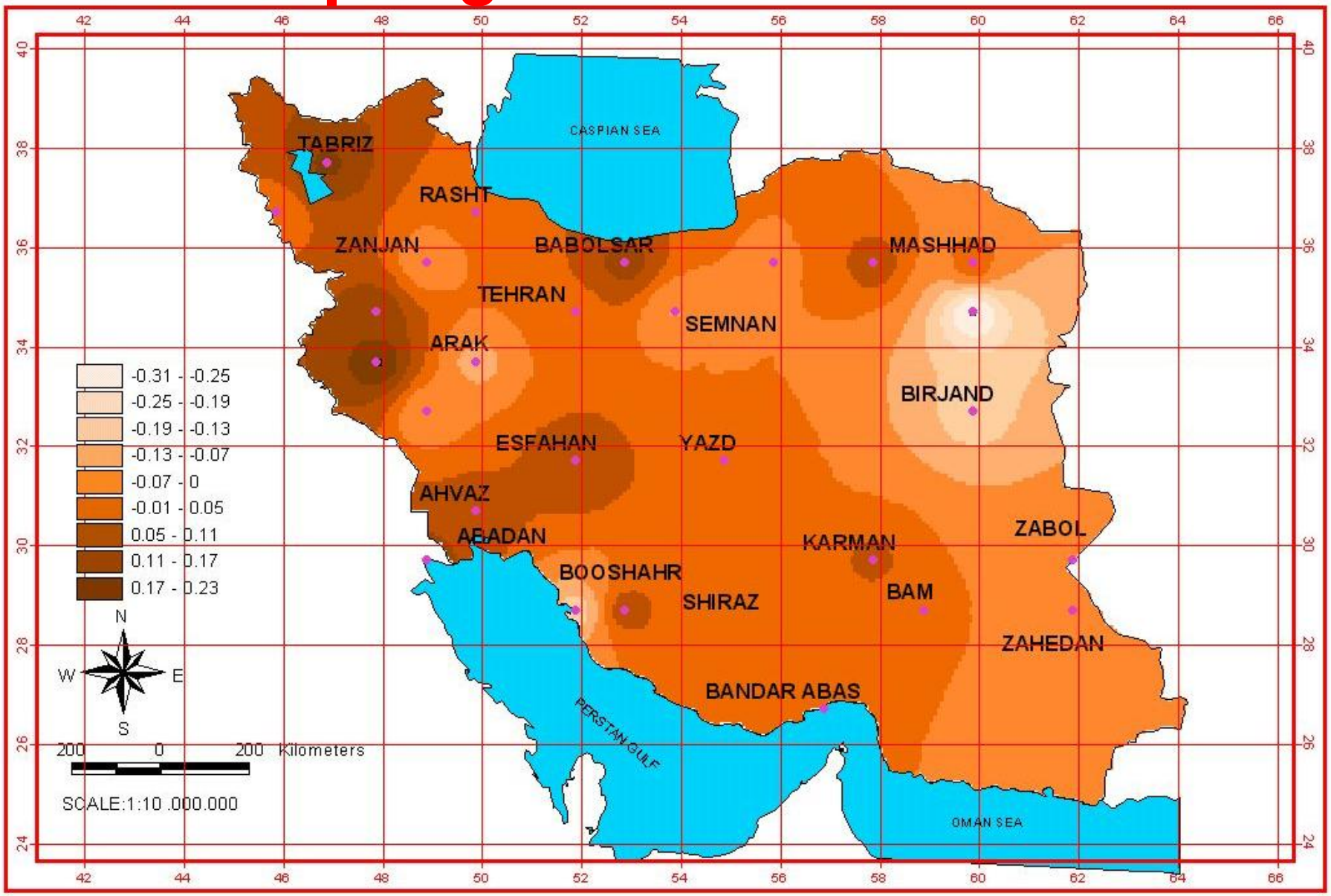
Annual Maximum Temperature Trend over Iran



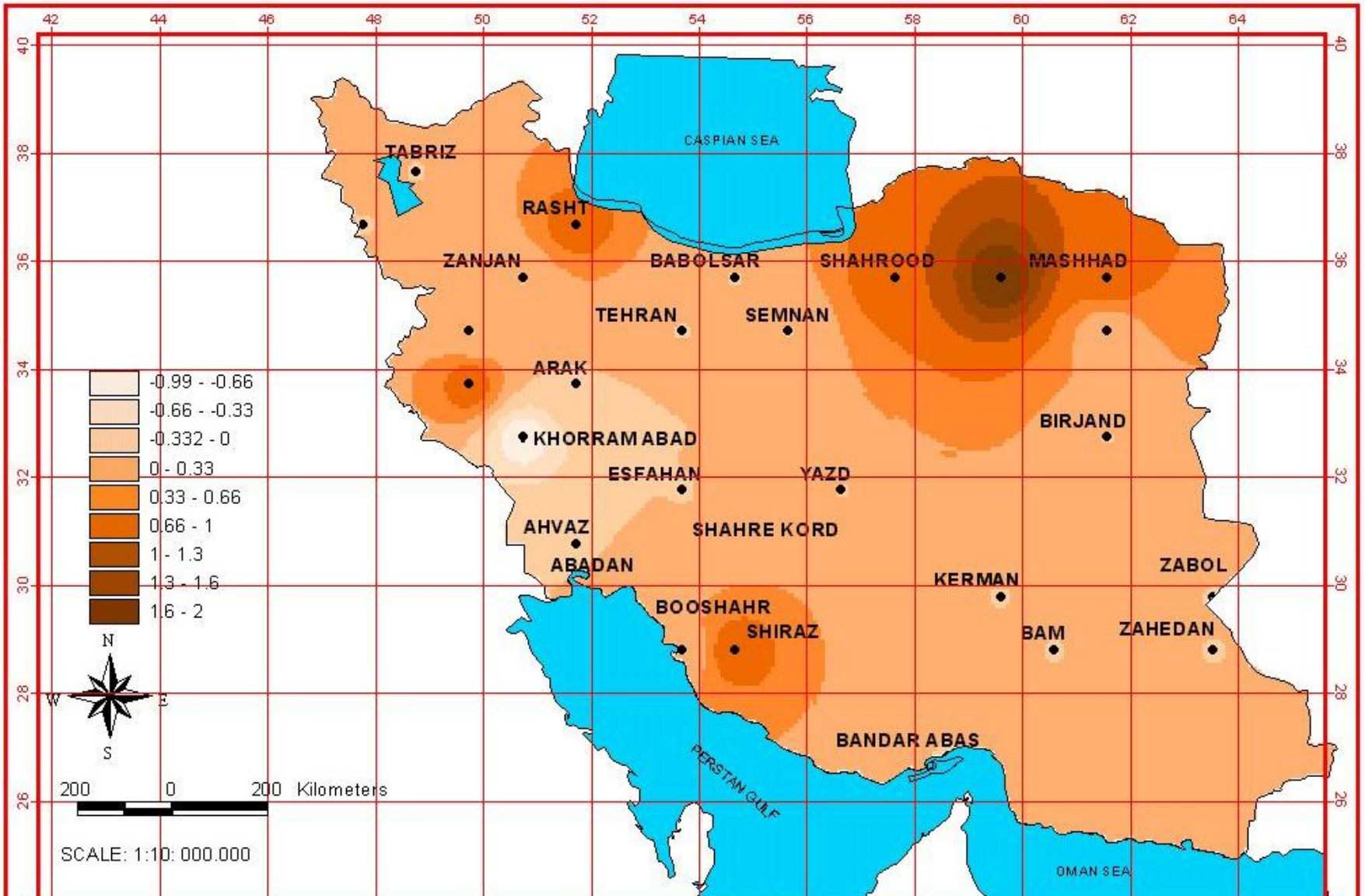
Annual Minimum Temperature Trend over Iran



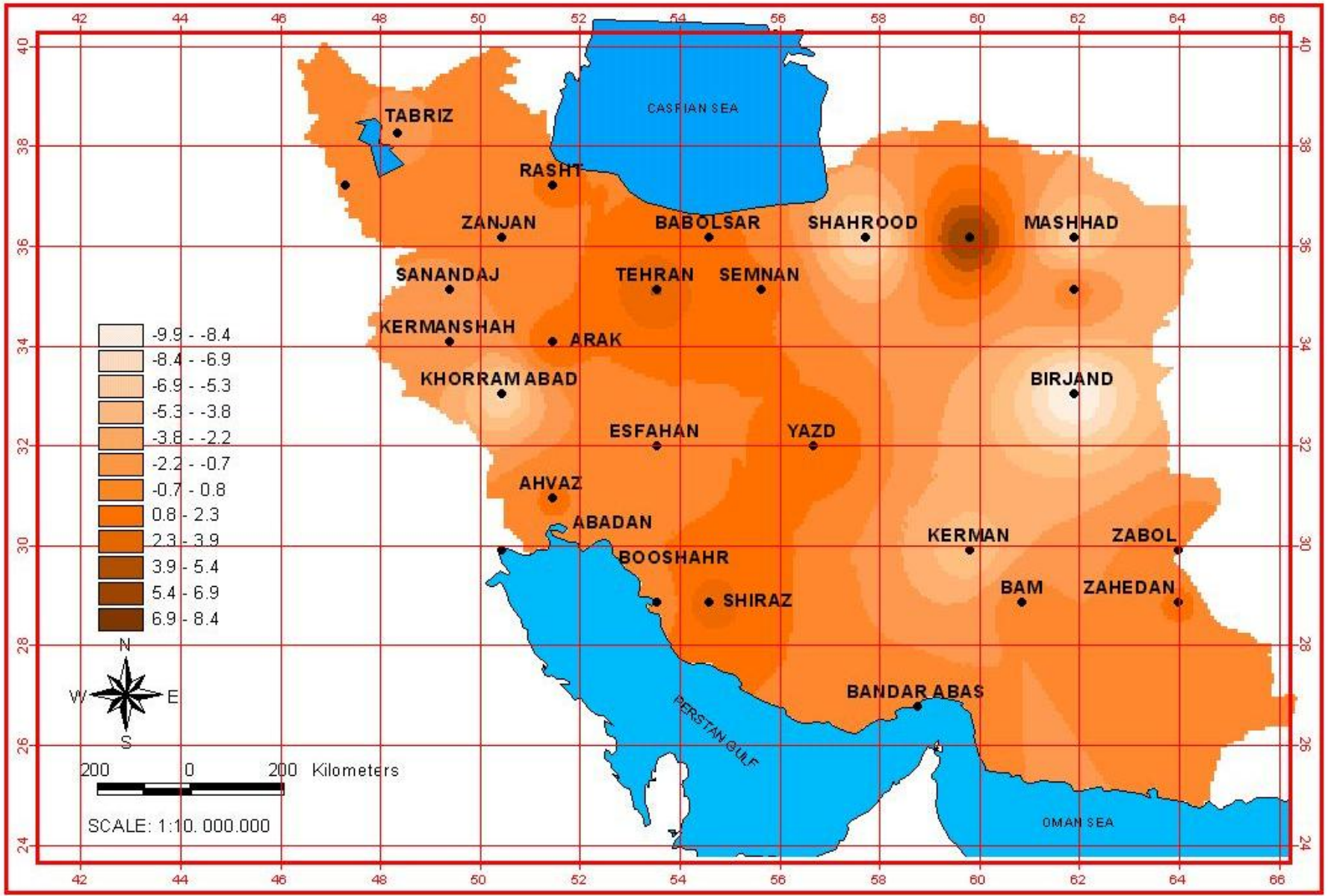
Seasonal Maximum Temperature Spring Trend over Iran



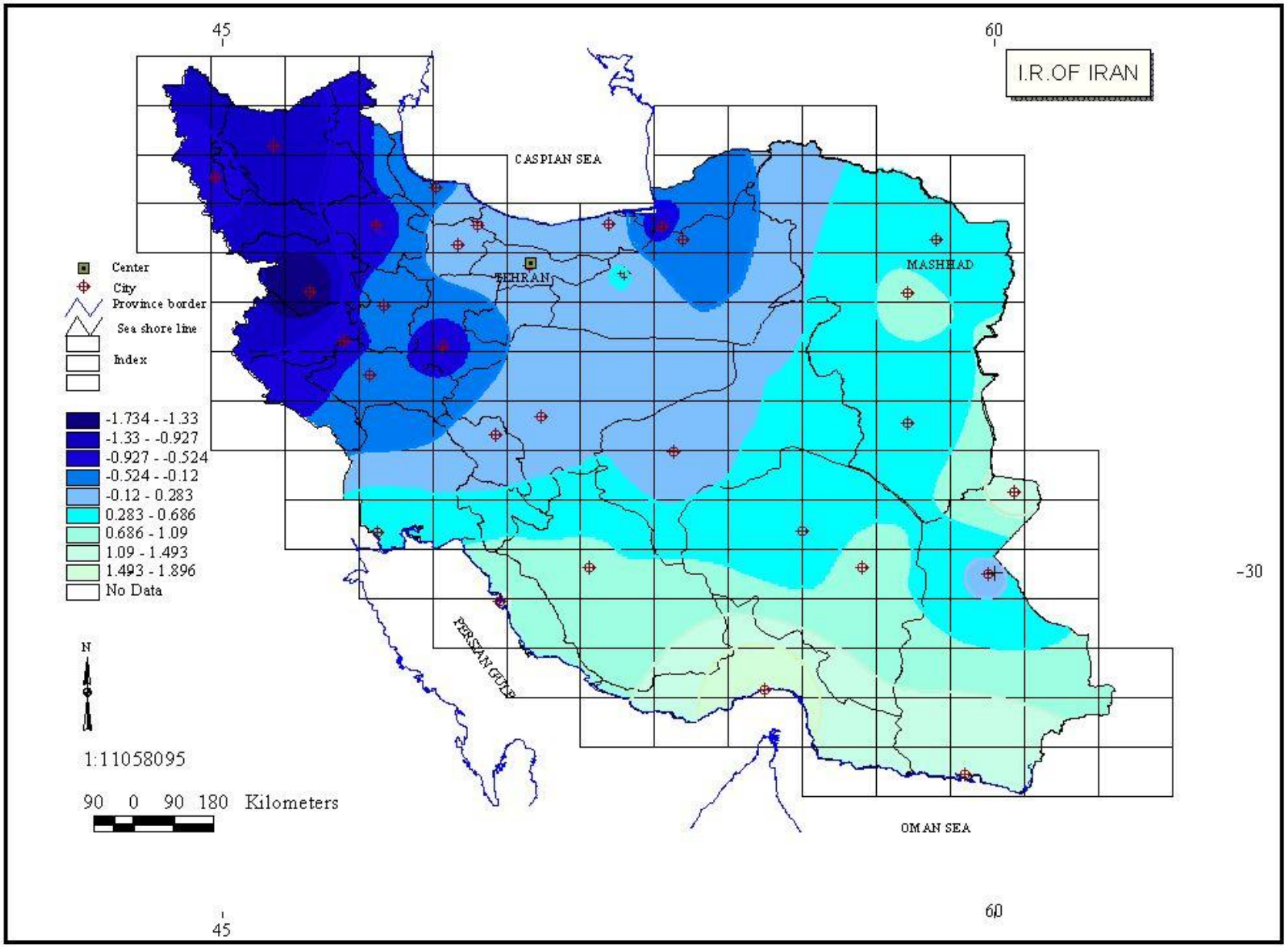
Seasonal Minimum Temperature Spring Trend over Iran



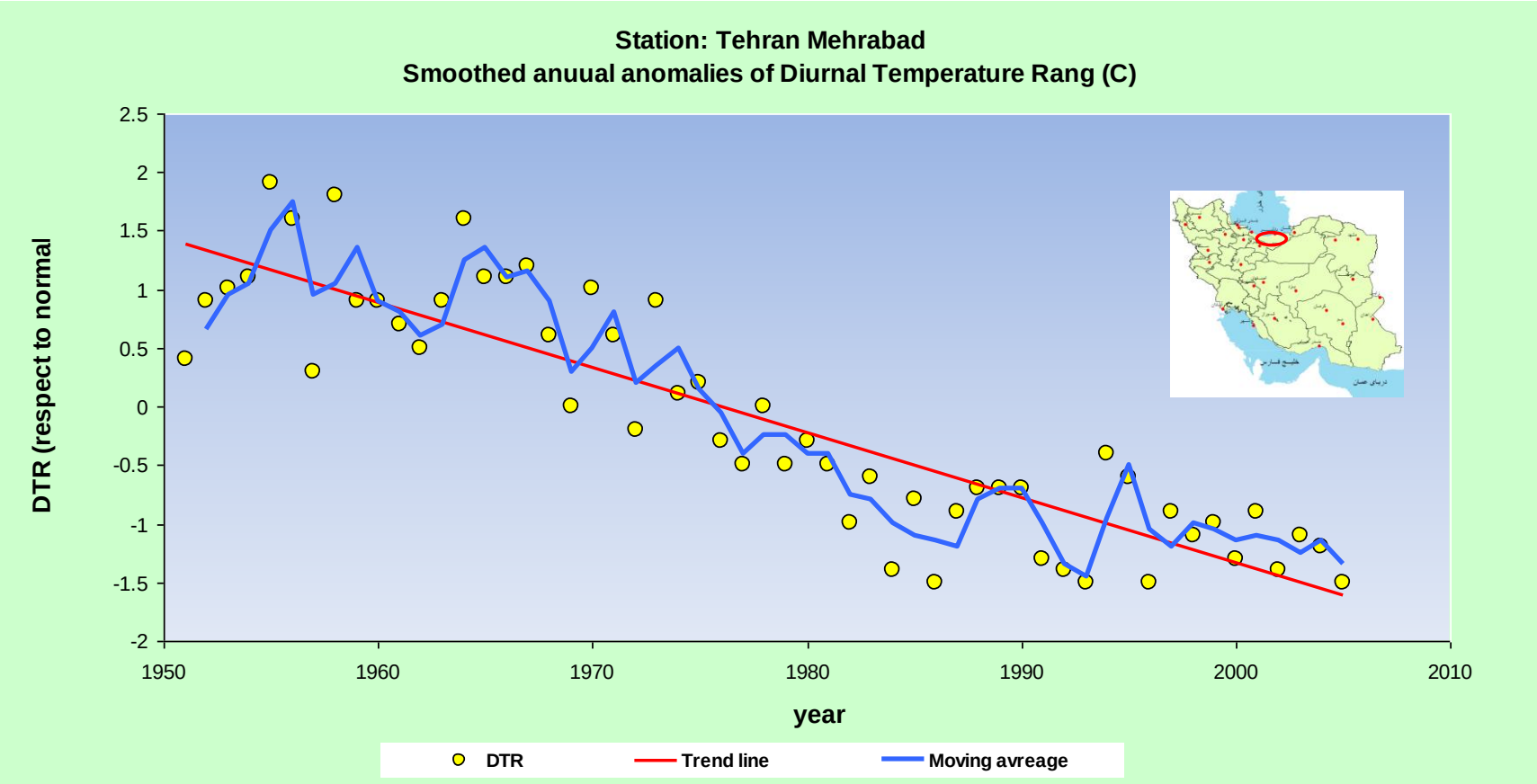
Seasonal Minimum Temperature Winter Trend over Iran



Annual Precipitation Trend



Decreasing of Diurnal Temperature Range (DTR) during 1951-2005 for Tehran-Mehrabad



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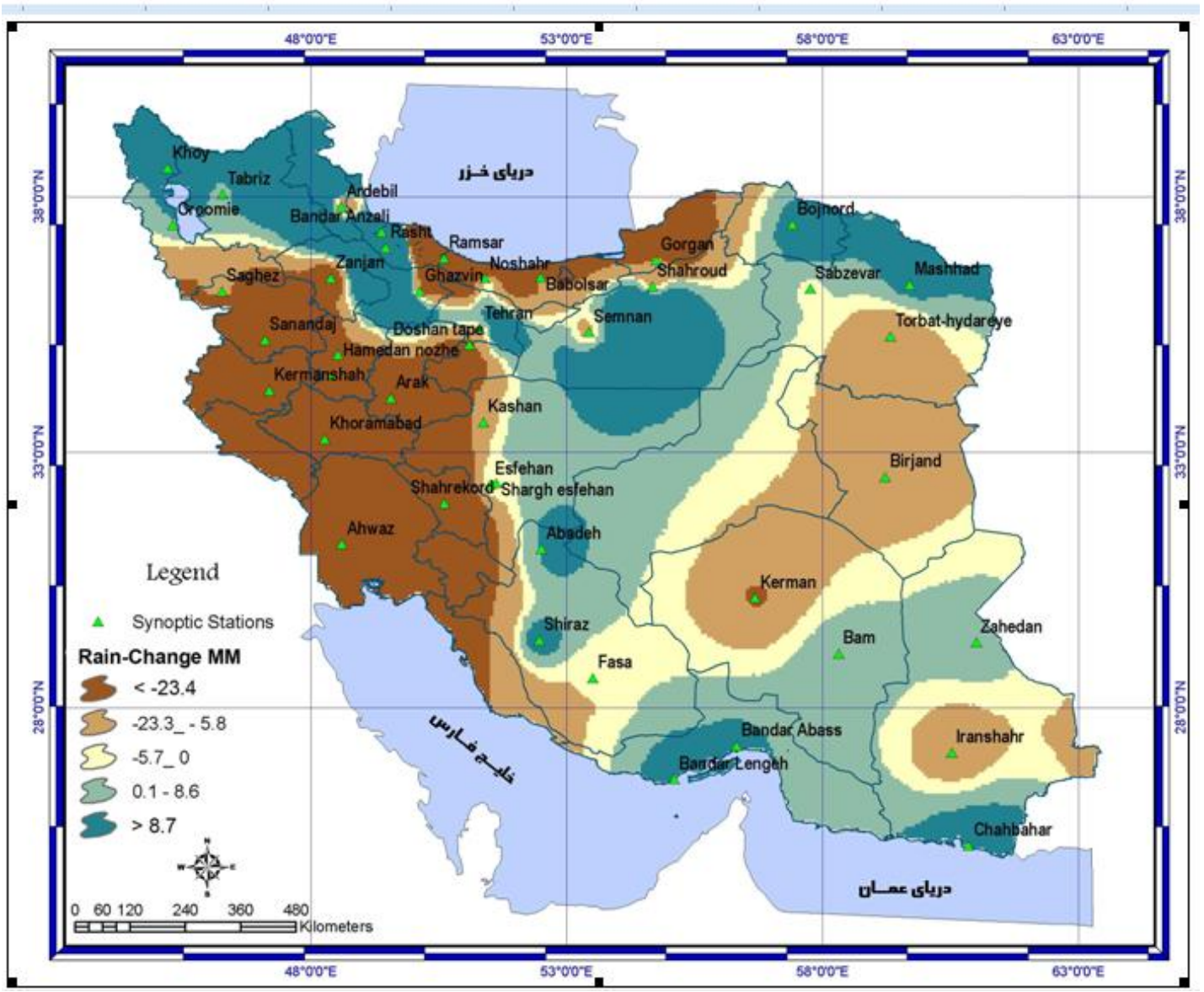
Result of Climate Data Analysis

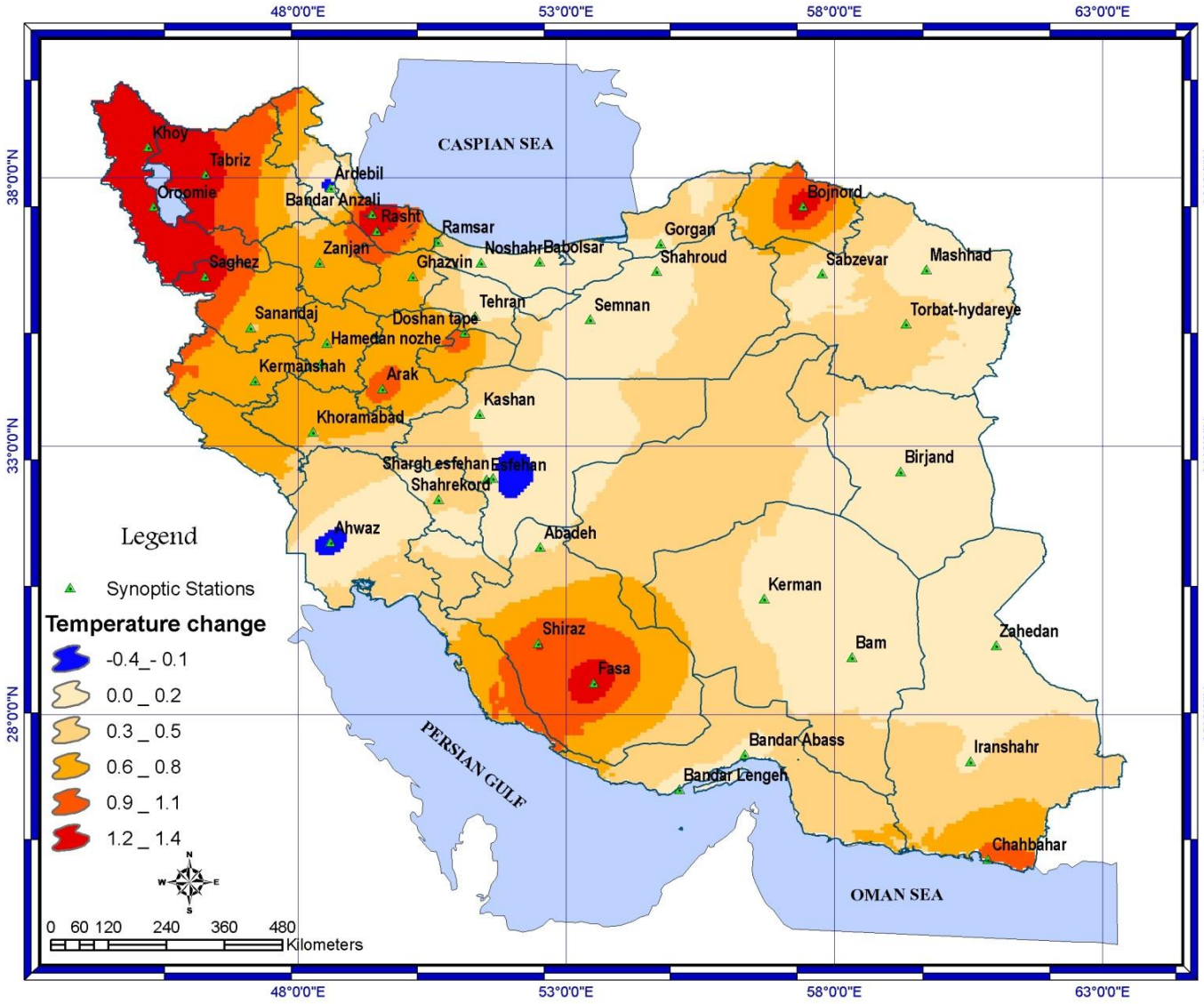
- Change of Temporal and Spatial Pattern of Temperature
- Shift of Season
- More Warmest Autumn and Winter

- **How climate will be in future?**

Precipitation change forecast relative to historical recordings in the period 2010-2039 – (LARS – WG) Model



Temperature change forecast relative to historical recordings in the period 2010-2039 – (LARS – WG) Model



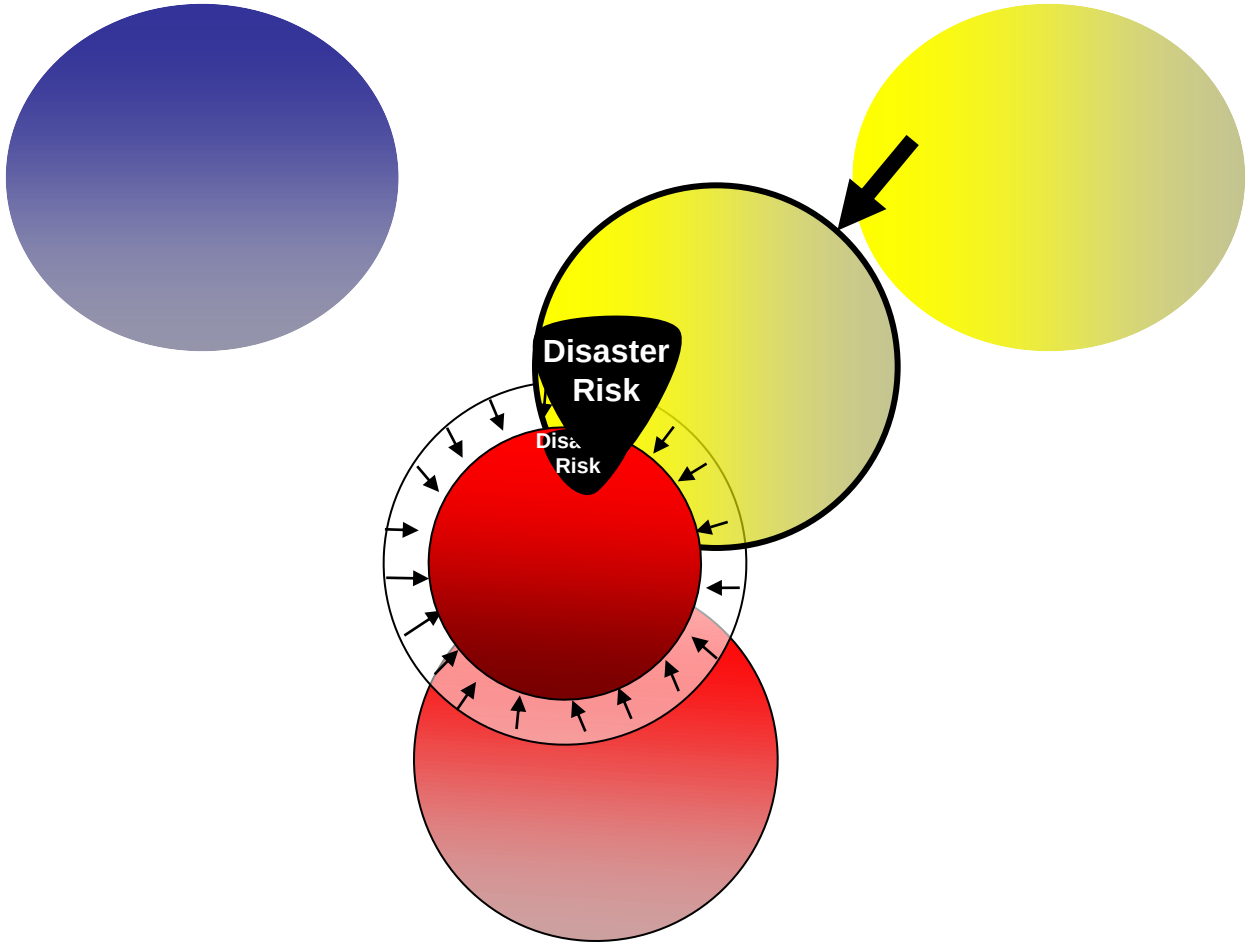
Next Steps 1

- Risk Reduction :

  Through Effective Monitoring and Early Warning System

Hazards

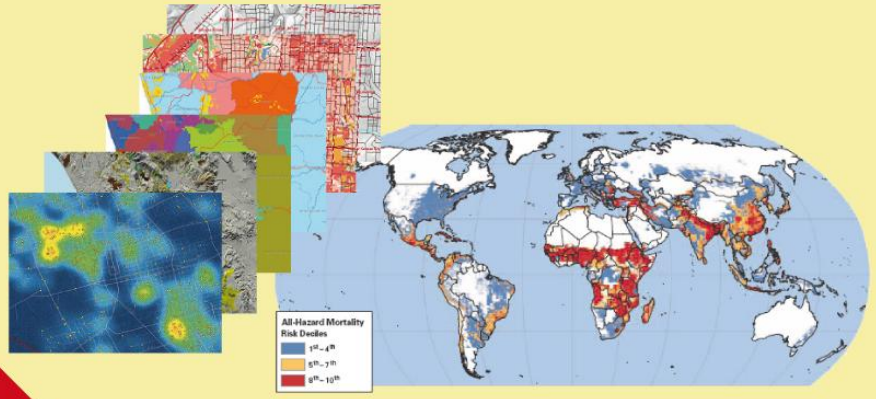
Exposure



Vulnerability

Effective Early Warning Systems

Hazard Data and Forecasts



Risk Information

Coordination and Collaborations

Communication and Dissemination Mechanisms

Preparedness and Early Response

Next Steps 2

- Capacity Building for :

Green and Clean Energy and Growth

Clean and Green Energy and Growth

Next Steps 3

- Climate Change Mitigation and Adaptation must be an Integral Part of National Developing Plan

There are Limits to Adaptation

Next Steps 4

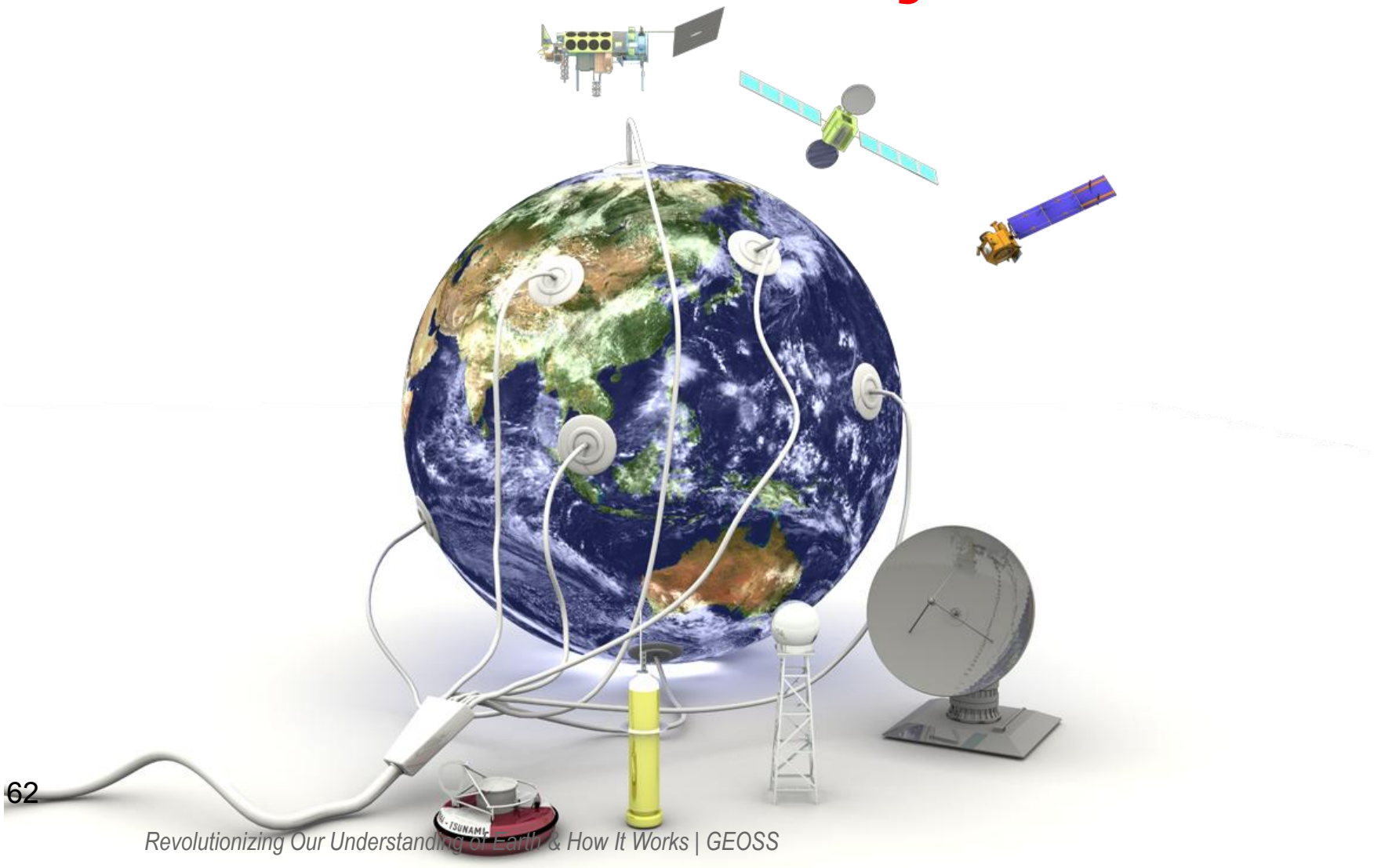
- Enhance Using Advanced Technology Such as Space Based Network, Satellite Applications, and Remote Sensing,


Wind
Voyager 1 & 2
RHESSI
Geotail
Jason-1
Aqua
SOHO
TIMED
QuikSCAT
TRACE
ERBS
Cluster
ACE
ACRIMSAT
IMAGE
Landsat 7
NMP/EO-1
Ulysses
TOREX/Poseidon
Polar
TRMM
FAST
SAGE III/METEOR-3M
SORCE
UARS
GRACE
SeaWiFS
EP-TOMS
Terra
ICESat
Aura

Next Steps 5

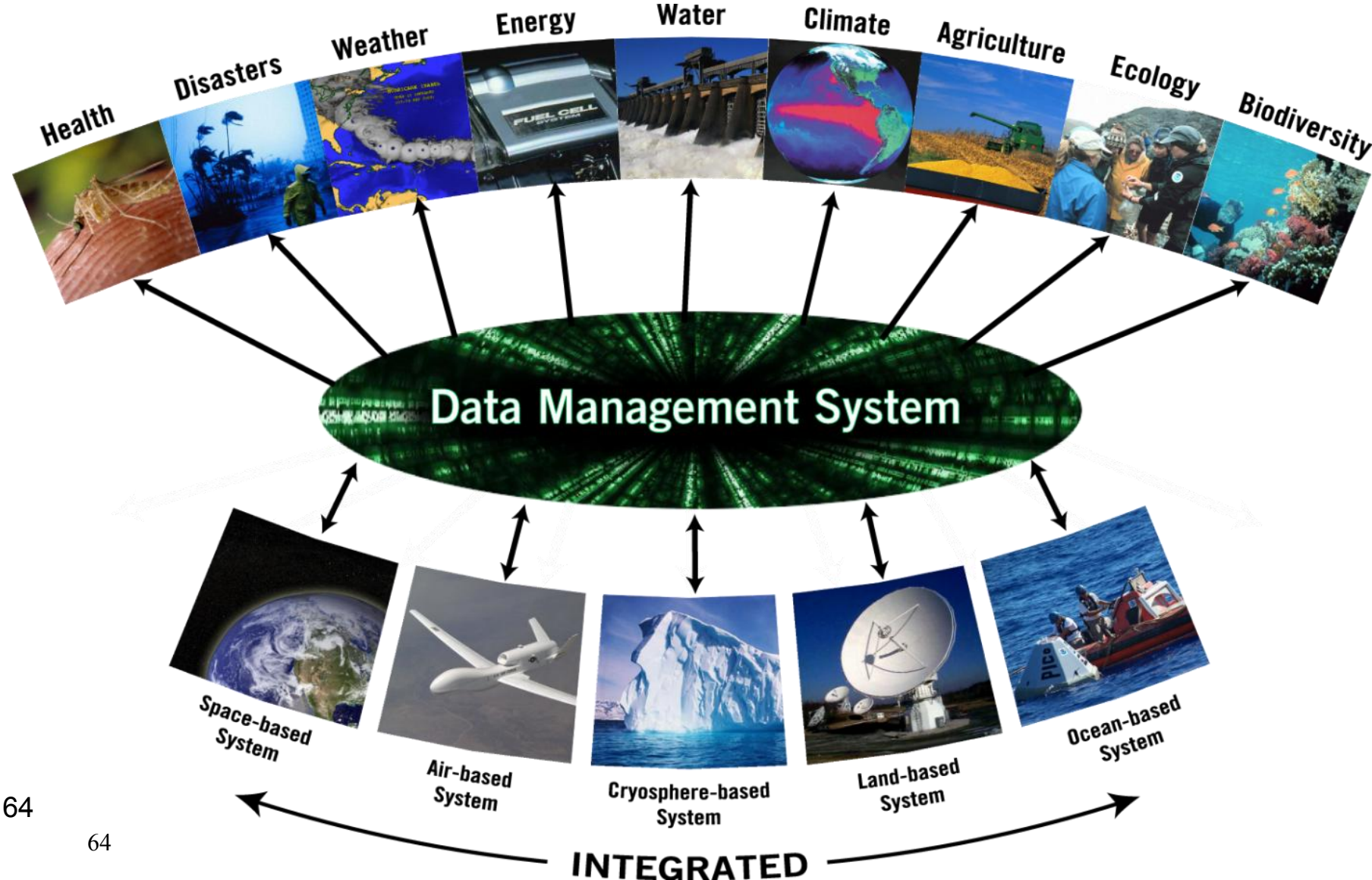
- Integrated Earth Observation System

Integrated Earth Observation System



THE GLOBAL EARTH OBSERVATION SYSTEM OF SYSTEMS

Global Earth Observation Systems of Systems (GEOSS)



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Concluding Remarks - 1

- Promoting the existing scientific and research capacities in the countries of the region regarding to global environmental changes monitoring
- Improve access to Data and information
- Promoting Multilateral cooperation in the region to assess climate change therefore environmental changes

Concluding Remarks - 2

- Applying the outcomes of climate change researches in the planning and policies
- Create structures, rules and regulations for monitoring the changes in the countries of the region
- Strengthening regional environmental centers

Thinking Together

Working Together

Thanks for your Kind Attention

با تشکر - والسلام