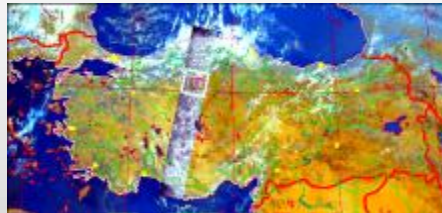




TÜBİTAK

TÜBİTAK's Role in EGIDA *as a GEOSS Stakeholder*



Dr. Tamer ÖZALP

1st Joint Workshop of the EGIDA Stakeholder Network and Advisory Board
*Connecting GEOSS and its Stakeholders
in Science and Technology*

Bonn, Germany
May, 9-11 2011

THANKS TO

**EGIDA Project Coordinator
Bonn University**

**European Commission
GEO Secretariat**



Turkey in BRIEF



About TÜBİTAK



Earth Observation Landscape in Turkey



Stakeholder's Activities as TÜBİTAK

Government Priorities



Policy and Programme

Areas and Projects

Budget and Current situation



*GEO*Turkey Activities

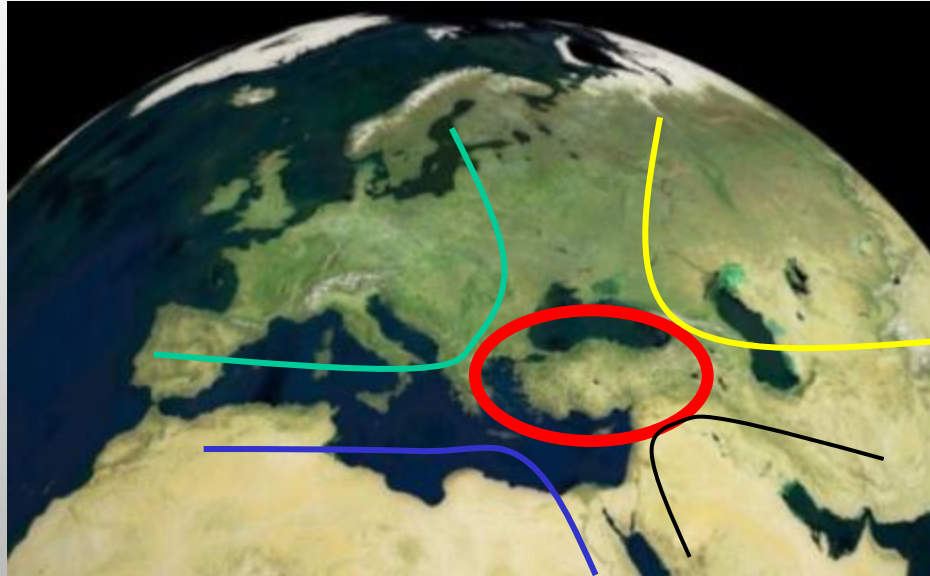
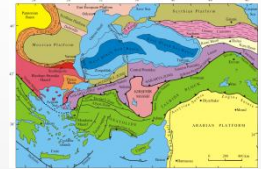


Summary MAP

Turkey in Brief



UNIQUE GEO LOCATION Turkey made up of micro-plates



MEETS,

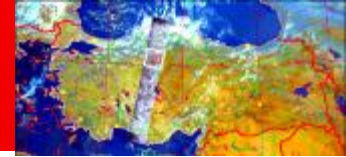
CONTINENTS - *Asia, Europe, Africa*

TECTONIC PLATES – *Eurasian, African, Arabian*

PASSAGEWAY *East West-North South Windows* - Energy-Transport

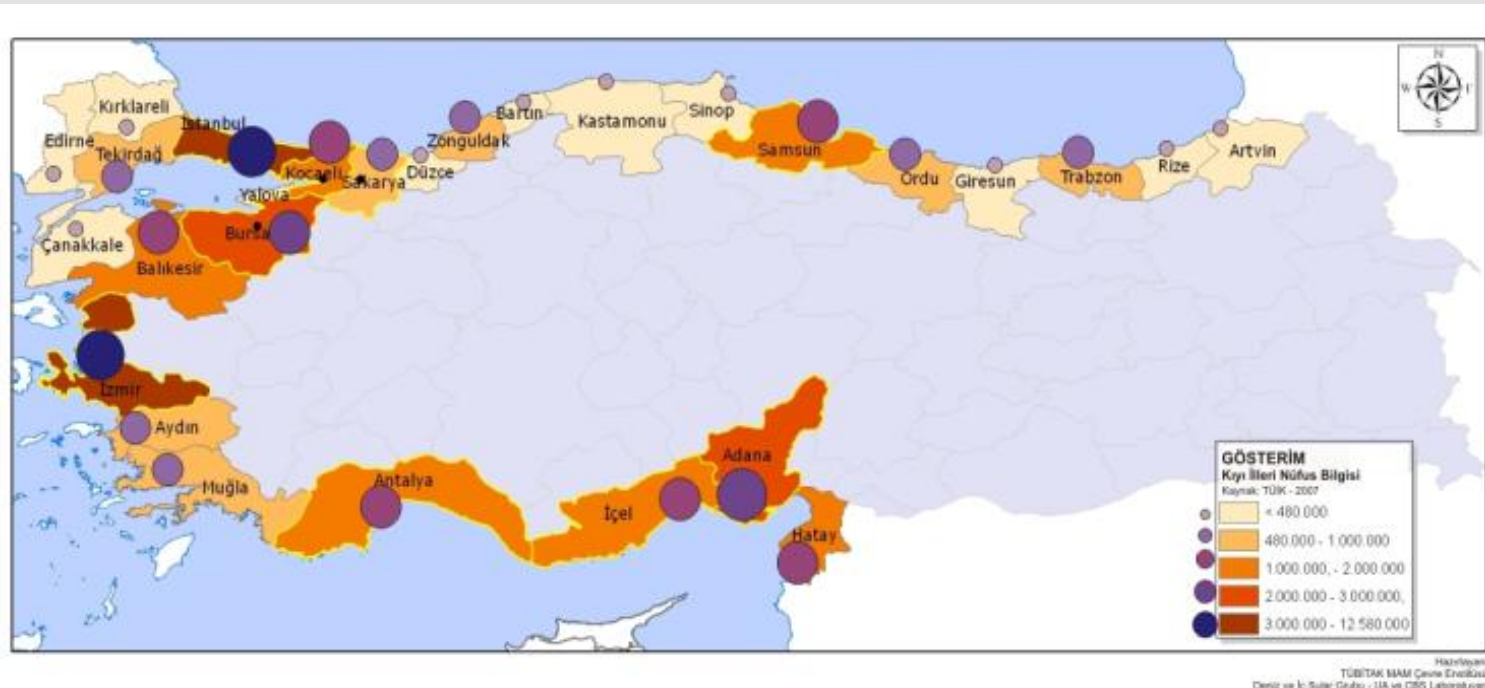
**SURROUNDED, *Black sea, Mediterranean, Aegean Sea,
Balkan, Caucasian, Middle eastern***

Turkey in Brief, *Facts*

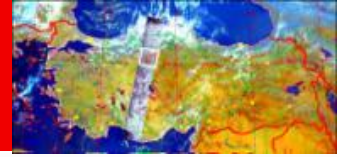


70 million in population,

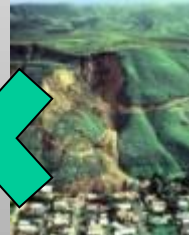
40 million lives in coastal zones and in urbanized areas,
mega cities (more developed and problematic areas),
Coastline is 8484 km in long



Turkey in Brief, *Facts*



Turkey is a country with a **rapid rate of change** in many aspects: its **urbanization process** is not sufficiently controlled, it has **large development projects** (highways, dams, irrigation, housing, infrastructure etc.), it undergoes changing **agricultural practices**, causing **environmental problems** with **soil erosion**, and **deforestations**.



Moreover, prone to **natural hazards** such as landslides, flooding, **earth quakes**, and **uncontrolled developments** cause higher risks and in the likely case of disaster event higher damages.

About TÜBİTAK



**The Scientific and Technological
Research Council of Turkey, Ankara**



- 
- **Established** in 1963, TUBITAK is an **autonomous public institution**, governed by a Science Board.
 - **Responsible** for promoting, developing, organizing, conducting and coordinating STI.
 - **Reports** directly to the Prime Minister and acts as an advisory agency to the Turkish Government on science and research issues.
 - The secretariat of the Supreme Council for Science and Technology, i.e. the highest S&T policy making body in Turkey.

Mission

- Develop** Science, Technology and Innovation (STI) policies,
- Help to** create the necessary infrastructure and the means for implementation of these policies,
- Fund** R&D,
- Perform** R&D,
- Coordinate** Turkey's international STI relations,
- Lead** the way for fostering a culture of science and technology in society,

in line with **national priorities**, and in cooperation with all segments of **the society** and with the related institutions, in order to increase the country's competitive edge and raise the standard of living in sustainable ways.

TÜBİTAK's R&D Institutes



R&D Units:

Marmara Research Centre (MAM)

Energy Food Genetic Engineering & Biotechnology Ins.

Materials Chemistry, Environment Institute

Earth & Marine Sciences Institute

National Research Institute of Electronics and Cryptology (UEKAE)

Defence Industries Research and Development Institute (SAGE)

Space Technologies Research Institute (UZAY)

National Metrology Institute (UME)

Research Institute for Basic Sciences (TBAE)

Turkish Institute for Industrial Management (TÜSSİDE)

R&D Support Units:

National Academic Network and Information Centre (ULAKBİM)

TÜBİTAK National Observatory (TUG)

Test and Analysis Laboratories (ATAL, BUTAL)

ARDEB provides TÜBİTAK support through a constellation of committees which scrupulously evaluate each and every application with the assistance of neutral panels of scientists and dispend the funds accordingly:

Research Grant Committees

Environmental, Atmospheric, Earth and Marine Sciences (ÇAYDAG)

Electrical, Electronic and Computer Sciences (EEEAG)

Public Sector (KAMAG)

Engineering (MAG)

Defense and Security Technologies (SAVTAG)

Health Sciences (SBAG)

Social Sciences and Humanities (SOBAG)

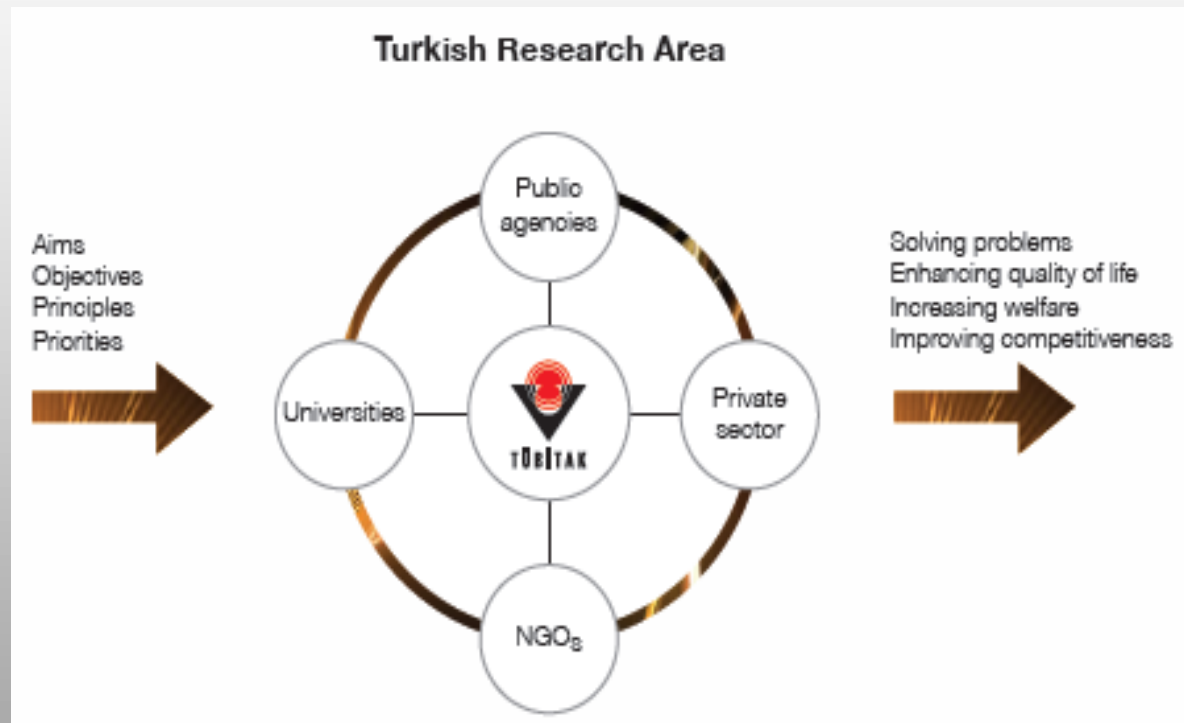
Basic Sciences (TBAG)

Agriculture, Forestry and Veterinary (TOVAG)

Space (UZAG)

Turkish Research Area (TRA)

TARAL set into motion a mobilization with which the business enterprise and public sectors, together with NGOs, strategically focus and collaborate on R&D and innovation.



TRA 2013 Targets:

GERD: %2 of GDP and FTE R&D Personnel: 150.000

Turkish Research Area (TRA) - Figures

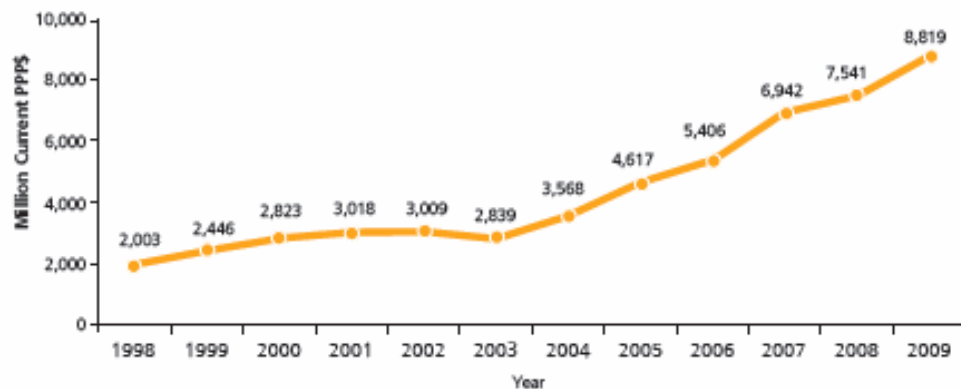


Figure 3.1: R&D expenditures of Turkey (Million current PPP \$) (Source: TurkStat)

Note: Gross salaries are used for the calculation of R&D labour cost in higher education sector after the year 2006.

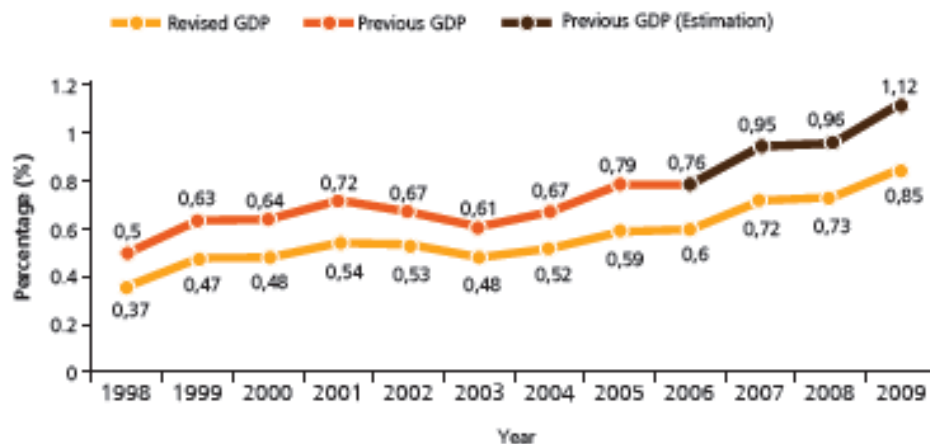


Figure 3.2: GERD as a percentage of GDP (Source: TurkStat)

(Note: Gross salaries are used for the calculation of R&D labour cost in higher education sector after the year 2006.)

TUBITAK's Budget

Total ~ € 700 million / year

- **Funding** (~ € 450 million/ year)
 - ✓ Academic research project grants (~ € 100 million)
(< 4000 proposals; $> \%30$ selected for funding)
 - ✓ Industrial, R&D and innovation grants (~ € 200 million)
(< 2000 proposals; $> \%30$ selected for funding)
 - ✓ R&D for public sector needs (~ € 120 million)
 - ✓ People support-Scholarships & Fellowships (~ € 30 million)
- **Research** – Institutes (~ 3000 Researchers,
~ € 100 million contract research revenue)

International Cooperation - EO



GEO (Group on Earth Observations)

European Space Agency (ESA), Cooperation Agreement

European Commission FP7, Env + Space

Asia Pacific Space Cooperation Organization (APSCO)

ROSCOSMOS, MoU

United Nations, Space Activities (OOSA)

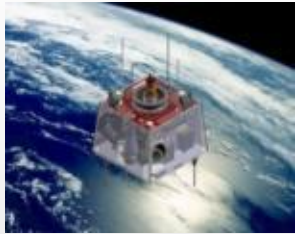
CEOS, Committee on Earth Observation Satellites

EUMETSAT,

ISPRS

Earth Observation Landscape in Turkey

Platforms and Measuring Categories



Satellite based

*Meteorological
Optical
GPS, Insar*



Ground Receiving stations



In situ,

*real-time observation
networks*



Marine/Ocean

color /biology
topography /currents
Surface temperature
wind, humidity, air
temperature and pressure

Atmosphere, Meteorological

Aerosols, humidity,
temperature, Cloud type,
amount and temperature
particle properties and profile
Liquid water and precipitation
rate, trace gases

Land

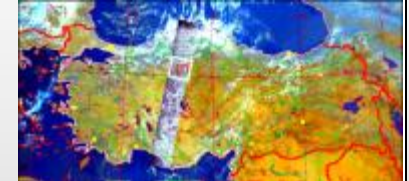
Landscape topography
Soil moisture
Vegetation
Reflectance

Solid Earth

Snow and Ice

Snow cover, edge and
depth

Earth System - National Models



Disaster

Weather

Climate

Water

Ecosystem

Agriculture

Biodiversity

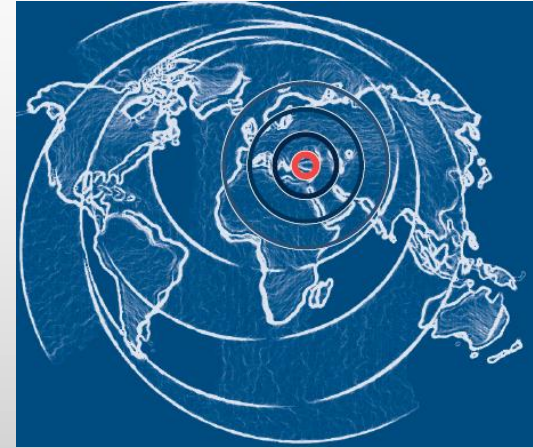
Prime Minister's Initiative- Turkey's Research Priorities, Policy and Programmes



AREAS

2005

- Human Resources
- Defense Research
- **Space Research**
- Science and the Society



2010

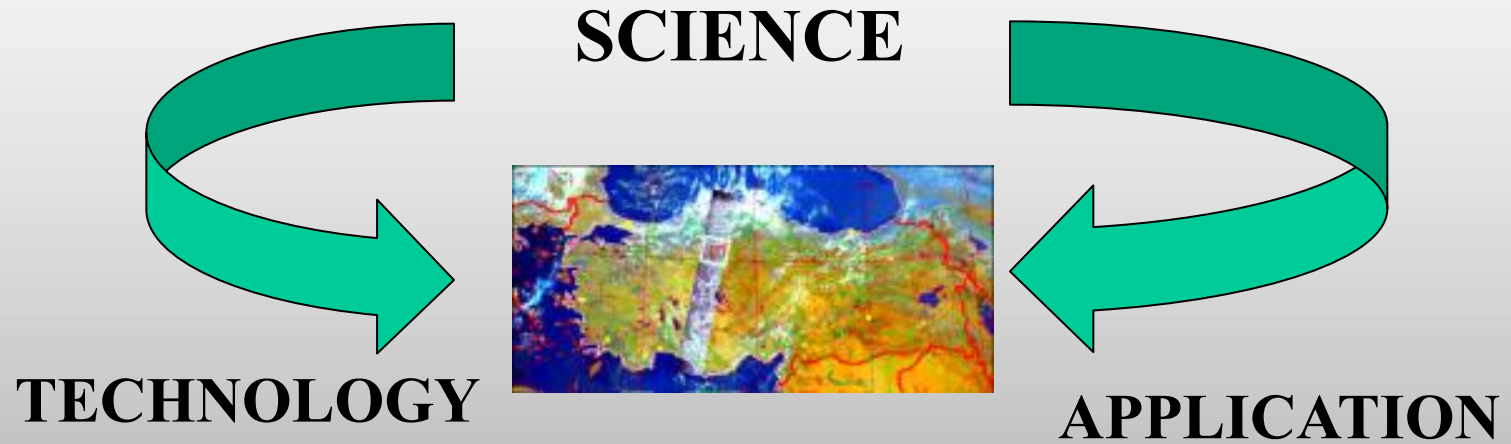
Energy, Water and Food Research

National Space Research Programme

The budget and the areas of the Turkish National Space Research Programme

Programme		2005-2014 proposed (TL millions)
SCIENCE	Astrophysics	16
	Astronomy	10
	Near Space	1.5
	Earth Science and Observation	44
	Life Science, Microgravity	1.5
	Total	73
TECHNOLOGY	Space (System) Infrastructure (Satellite, Ground Control, Launching)	809
	Space Technology (Development)	102
	Space Transportation-Advanced Aeronautics	30
	Space Security	5
	Total	946
APPLICATION	Remote Sensing and Geographic Information Systems	10
	Navigation and Global Positioning System	5
	Meteorology	5
	Satellite Communication	10
	Total	30
HUMAN RESOURCES AND KNOWLEDGE	Future Generation	40
	Society and Culture	5
	Total	45
INTERNATIONAL COOPERATION	European Space Agency and European Union Relations	15
	International Cooperation (NASA, Russia, China, Ukraine, India, Japan, UN e.g.)	5
	Regional Cooperation (Southeast Europe, Balkans, Caucasus, Black Sea, Middle Asia, Mediterranean, Middle East)	10
	Total	30
MONITORING AND COORDINATION	Strengthening National Coordination and Cooperative work	1
1 eur = 1.69 TL 1usd=1.28 TL(March 2005)		
General Total		1 125

Programme Areas - GEOSS



Activity Areas

SCIENCE

Monitoring and investigating the Earth being a part of space

Earth searching the unknown about the factors effecting scientific or economically aimed activities done/will be done in or out of the atmosphere, investigating the problems that are faced, searching solutions to these problems, and doing exploration, investigation, monitoring, informative studies.

Earth (Science) Observation

Solid Earth

- Land Cover/Land Use
- Monitoring environment
- Soil and Soil Moisture
- Natural and Nonrenewable Energy Resources
- Measurement of Earth/Crust Movements
- Mitigation of Natural Hazards Risk Assessment and Management
- Early Warning Systems
- Agricultural Biomass Research
- Protecting the Forests and Increasing the Productivity
- Water resources, Hydrology
- Ecosystem, Biological Diversity

Atmosphere, Climate, Global Warming

Meteorology, Weather prediction, forecast models

Marine and Coastal Zone Studies

*Producing sensors, Developing measurement tools,
Data analysis and improving the processing methods,*

Activity Areas

TECHNOLOGY

Space technologies play a key role in accelerating the development processes of the countries, increasing the life quality standards of societies and security of the countries.

To increase welfare of the society, assessment of natural resources, protection of the environment

Space (System) Infrastructure

Satellite

Satellite Design and Development

*Disasters (Early Warning), Meteorological,
Navigation, Global positioning,
Communication*

Pasive (Optic) ve Active (SAR, InSAR) Systems
High Resolution (1m-2.5m)

*Communication and Transmission
Earth Science
(Land Cover, Natural– Energy Resources)*

Modelling and Simulation,
Data Analysis
Data Assimilation,
Data Processing,

Activity Areas

APPLICATION

The space based application areas that takes place in decision support processes of the government institutions, and converted into a structure that can be reached by almost all sections of the society. These applications take an important place in strategic and economic areas of the countries.

- 1. Remote Sensing and Geographic Information Systems**
 - 2. Navigation and Global Positioning System**
 - 3. Meteorology**
 - 4. Satellite Communication and Telecommunication**
-

Developing application software, e-government applications, web services, data harmonization and standards, advanced satellite communication services, e-learning, e-health, generic use

Spatial Planning, Agricultural practices, Forest Fires, Land erosion, Pre and post earthquake applications, Water Resources, Coastal Zone Management, Environmental Pollution, Land Cover Change, Monitoring Bosphorus and Black Sea, Energy Resources, Improvement of e-learning and e-health tools, Regional and rural studies, Urbanization

TÜBİTAK GEOSS Related Projects in progress and/or completed



<u>Programme</u>	Projects (#)
Space Research	
Public Research	
	279

National, Regional, Local Levels

(2005-2010)

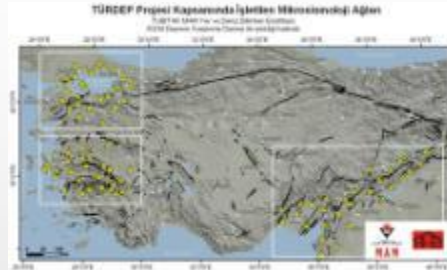
~130 million euro
in budget



Possible Turkish Contributions to GEOSS and Its Tasks



National Seismic Network
İstanbul Early Warning and
Rapid response system
Boğaziçi Univ.



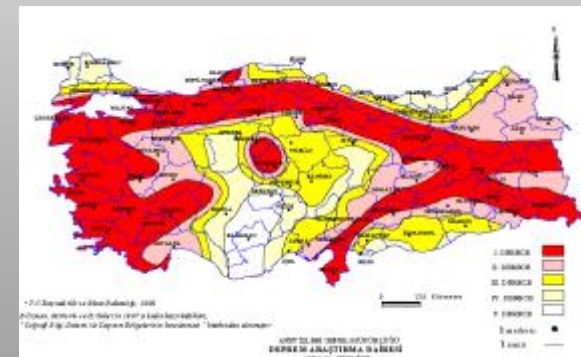
Urgent Monitoring
after Earthquake

Development and Operation of
Earthquake Monitoring Stations
Network of IMM

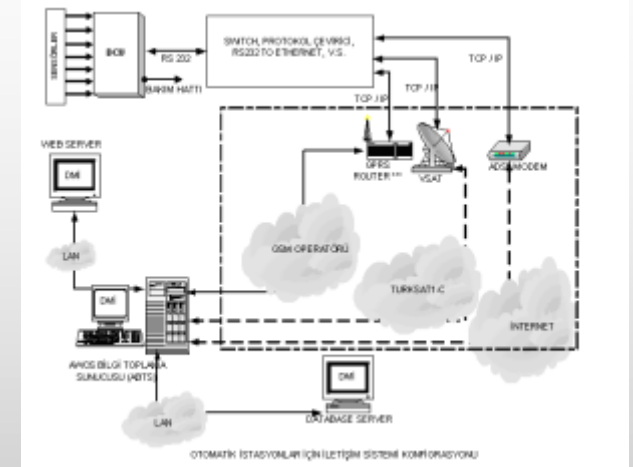


Upgrading Seismicity
Monitoring Infrastructure
Capacity in Marmara Sea

Multidisciplinary Earthquake
Research in high risk regions of
Turkey representing different
Tectonic regimes (TURDEB),
TUBİTAK MAM



Micro seismology networks operated under
TURDEP project,



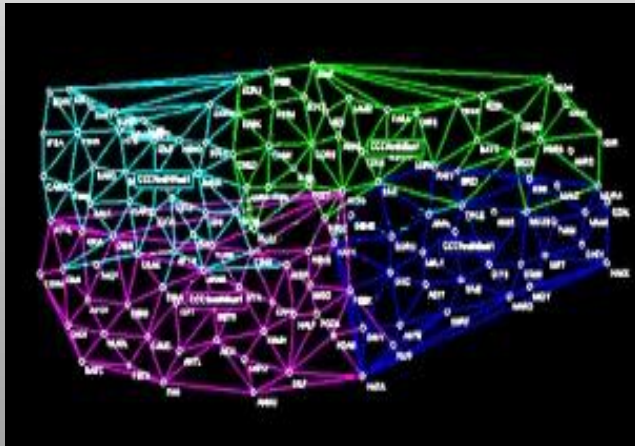
Meteorological Observation System and Early Warning Systems (METSIS), DG Meteorology

Possible Turkish Contributions to GEOSS and Its Tasks

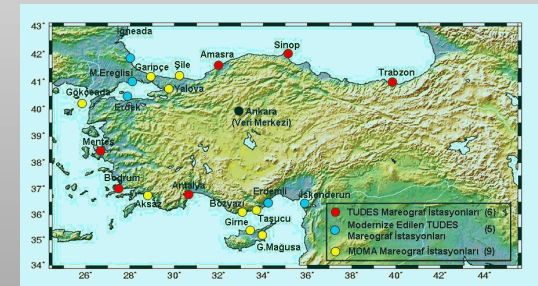


CORS-TR

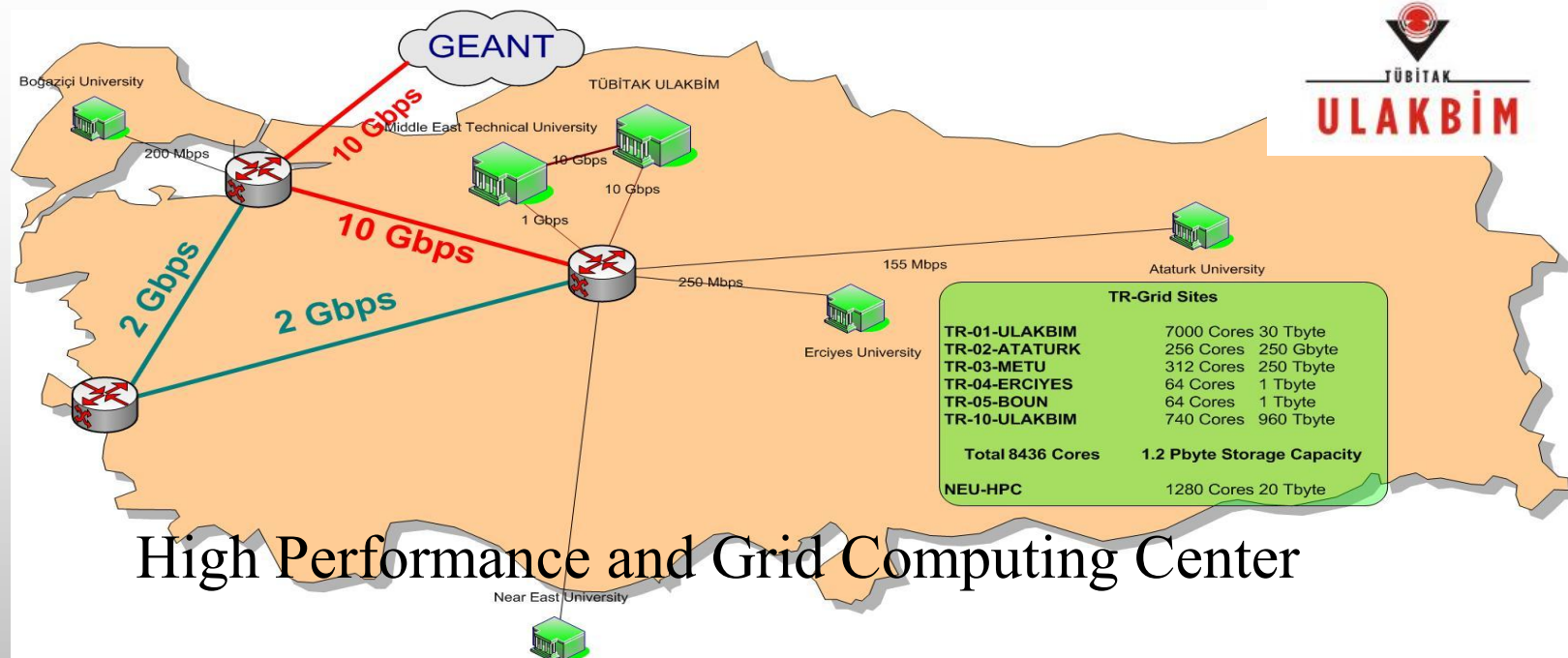
Continuously Operating Reference Stations) the Establishment of Network based Stationary Real-Time Kinematic (RTK) GPS Terminals and Determination of Cellular Transformation Parameters CORS- TR, Istanbul Kultur University (IKU), General Command of Mapping (HGK) and the Directorate of Cadastre and Land Registry (TKGM)



MOMA, The Meteorology and Oceanography Network of Excellence
DG Meteorology,
Maritime DG, **METU**
IMS



Possible Turkish Contributions to GEOSS and Its Tasks



TRUBA TR-GRID (Turkish Science e-Infrastructure)

FP6 & FP7 Projects (Finished 6 Projects)

- ☐ EGEE-II
- ☐ EGEE-III
- ☐ EUMEDGrid
- ☐ SEE-GRID
- ☐ SEE-GRID-2
- ☐ SEE-GRID-SCI

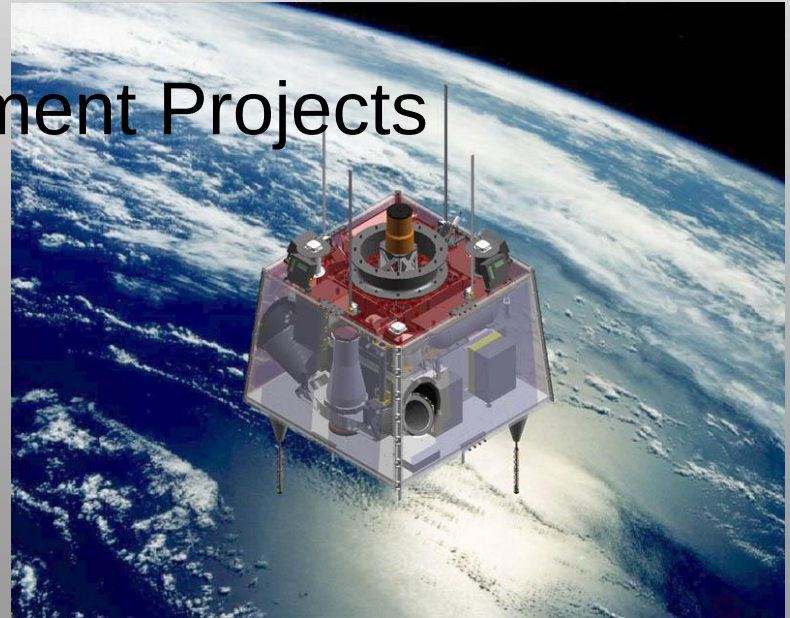
FP7 Projects (5 Ongoing Projects)

- ☐ SEERA-EI
- ☐ EUMEDGrid-Support
- ☐ EGI-InSpire
- ☐ e-IRGSP3
- ☐ HP-SEE

Possible Turkish Contributions to GEOSS and Its Tasks



- System and Technology Development
- BiLSAT Project
- Sub-System Development Projects
- RASAT Project
- Göktürk Project



Possible Turkish Contributions to GEOSS and Its Tasks

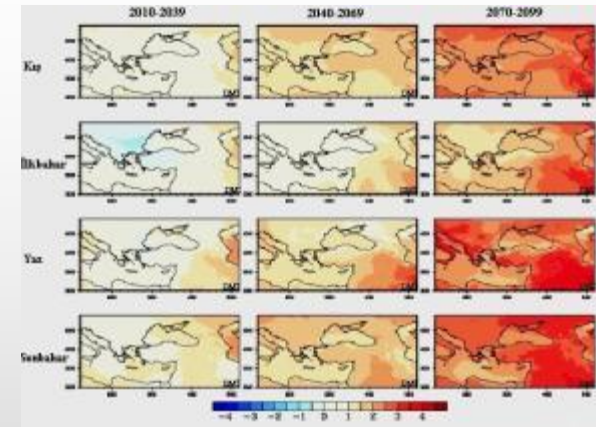


Climate Change Scenarios for Turkey, ITU

**RIVER MONITORING AND
POLLUTION CONTROL SYSTEM,**
Ankara University, Env and Forestry Ministry



**Forest Fire Identification and Monitoring
Systems based on computer vision methods,**
Bilkent University, DG Forestry



**Development of Land Evaluation Systems for Analyzing
Climatic Risk in Agriculture**
Ministry of Agriculture, TAGEM

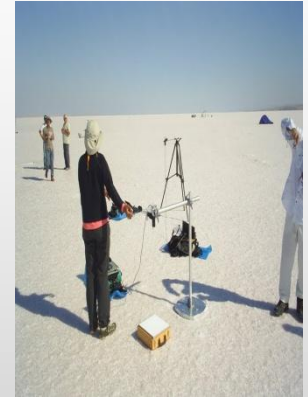
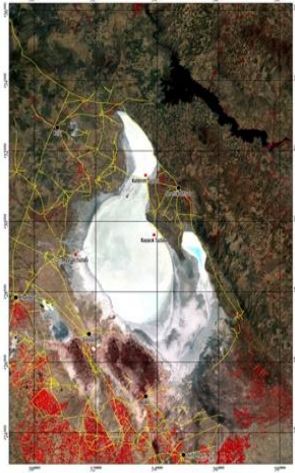
Biodiversity Inventory of Turkey, Ministry of
Agriculture, TAGEM

Possible Turkish Contributions to GEOSS and Its Tasks



TUBITAK UZAY Institute contributions to GEO

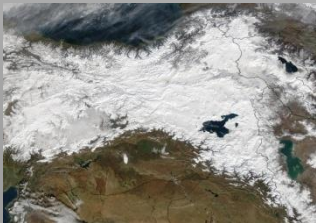
- Absolute radiometric calibration test site in Tuz Golu, Salt Lake.



- Baku-Tbilisi-Ceyhan Pipeline Vegetation Cover Monitoring Project.
(*BTC Pipeline Company BP*)



- Determination of Snow Water Equivalent In Eastern Anatolia, Employing Satellite Technologies Project
(*State Hydraulic Works of Turkey*)



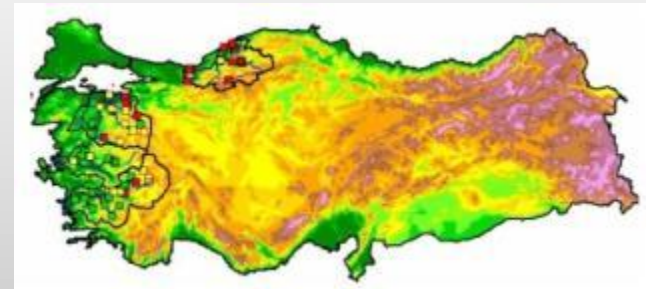
Possible Turkish Contributions to GEOSS and Its Tasks



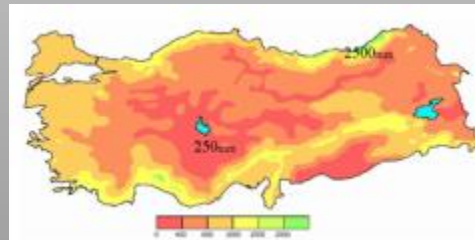
VSAT (satellite communication)

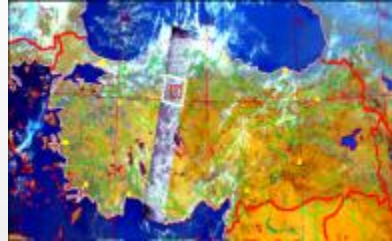
Emergency Flood and Earthquake Recovery Project

Flood Forecasting System in Turkey TEFER component takes real time monitoring data of the catchment and produces forecasts of the flood state of the catchment.

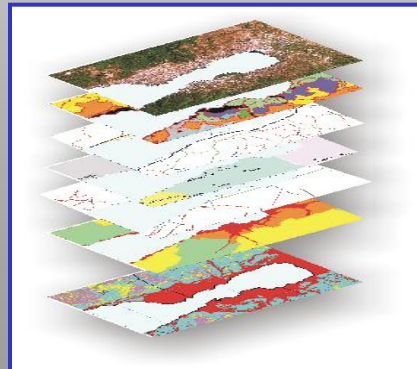


Annual Rainfall Distribution of Turkey





**National Spatial Data Infrastructure,
National GIS (TUCBS),
Min of Public Works and Settlement
the Directorate of Cadastre and Land Registry
(TKGM)**



Turkey is a member of GEO since 2008.

TUBITAK is the national representative agency for Turkey.



GEOTurkey Office,
TÜBİTAK HQ, Ankara

GEO*Turkey* Activities

- 14th Architecture and Data Committee meeting (September 2010, Ankara)
- 2nd GEOSS Interoperability Workshop (August, 2010, Ankara)
- **13th Science & Technology Committee Meeting**, (March 2010, Ankara)
- **3rd GEO European Projects Workshop** (October, 2009, İstanbul)
- GEO South – Eastern Europe and Eastern Mediterranean Symposium (June 2009, Athens)
- QA4EO workshop on Facilitating Implementation (Sept 2009, Antalya)



GEO VIII PLENARY- İstanbul, Turkey



**TÜBİTAK will host GEO-VIII Plenary in İstanbul, Turkey,
15-17 November, 2011,**



**GEO Secretariat and EC visit, Mr José Achache
April 26-28, 2011**

SUMMARY MAP

Turkey's Role can be summarized under the following areas;



**Space Systems
Ground Segments
Insitu Systems
Services
Data Integration, Management, Modelling, Standards**

**International Cooperation
Projects Support and Infrastructure Development
Promoting and Funding Mechanisms
Policy and Strategy, Programme
Supreme Council for ST
Government**

