

Introduction of METU –DMC
Recent Projects of DMC
and METU Academics

Assist. Prof. Dr. Meltem ŞENOL BALABAN

**Dept. City and Regional Planning,
Director of Disaster Management
Implementation and Research Center, METU**

25-26 November 2019, ACDR 2019 TURKEY

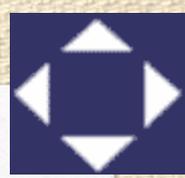
E-mail: mbalaban@metu.edu.tr



Short Bio



- Urban Planner (CRP 98') and Expert on Disaster Risk Management since 2002
- **Research Area:** Disaster Risk Mitigation, Urban Planning and Design, Flood Risk Management in Riverine Cities, Evacuation and Temporary Shelter Planning supported by GIS techniques, Urban Risks and Regeneration Projects, Heritage Sites under disaster risks
- Assist. Prof. Dr. in **City and Regional Planning** Dpt. @ Middle East Technical University (METU)
- Director of METU – **Disaster Management Implementation and Research Center (DMC)**
- Recent Projects:
 - Project Coordinator of METU – DSİM, 'İl Risk Azaltma Planı Hazırlama Kılavuzu Güncellenmesi ve Pilot Uygulama Projesi/ *Updating Provincial Risk Reduction Plan Guidance with Pilot Implementation Project*' with TR. Ministry of Interior, AFAD (2019 - ongoing)
 - Project Coordinator of METU – International Funds (JICA/TIKA) '**Third Country Training Programme (TCTP) for Disaster Risk Reduction and Building Community Resilience**' (2019 April-Last Round – completed)
 - Project Coordinator of METU- Scientific Research Project Fund '**Spatialization of natural and man-made hazards on UNESCO World Heritage Sites in Turkey**', Project Code: YÖP-202-2018-2853, (2018- ongoing)

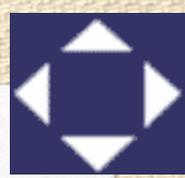


My Talk

- Disasters world wide and Turkey
- METU Academics and their innovative DRR activities
- Introduction of METU-DMC and its recent activities
 - DRM and Building Disaster Resilient Communities with JICA-TIKA
 - Provincial Disaster Risk Reduction Plan Pilot Project with AFAD
- METU Scientific Research Project on “Spatialization of natural and man-made hazards on UNESCO World Heritage Sites in Turkey”



Disasters World Wide and Turkey



Indonesia, Earthquake and Tsunami



Japan, Flooding and Landslide

Death Toll: **419**



North Korea, Flooding and Landslide

2018 Yılında Gerçekleşen Afetlerden Etkilenen İnsan Sayısı ve 21.YY ortalamaları

Total Number of People Affected by Disaster Type (2018 vs. average 21st Century)

Event	Afet Olayı	2018	Rate in Ave.	Average (2000-2017)
Drought	Kuraklık	9,368,345	% 15.9	58,734,128
Earthquake	Deprem	1,517,138	% 22.3	6,783,729
Extreme temperature	Aşırı sıcaklık	396,798	% 6.2	6,368,470
Flood	Sel/Su Baskını	35,385,178	% 40.8	86,696,923
Landslide	Heyelan	54,908	% 20.8	263,831
Mass movement (dry)	Kütle Hareketi (kuru)	0	-	286
Storm	Fırtına	12,884,845	% 37.8	34,083,106
Volcanic activity	Volkanik Hareket	1,908,770	11 x average	169,308
Wildfire	Orman Yangını	256,635	13 x average	19,243
Total	Toplam	61,772,617	% 31.9	193,312,310

Source: EM-DAT (International Disaster Database)



India, Monsoon floods

Death Toll: **1388**



USA, Forest Fires

Death Toll: **298**



Hydro-Meteorological Disasters from the examples of World Cities and Turkey



**HURRICAN
E KATRINA**



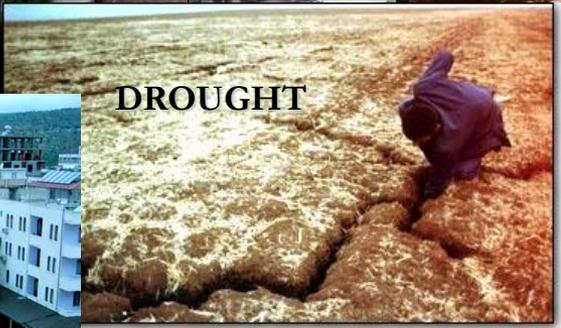
**EUROPE
FLOODS**



**HEAVY
SNOWFALL IN
EASTERN
ANATOLIA**



**FLOODS IN SOUTHERN
ANATOLIA**



DROUGHT



**HURRICANE
IN
MYANMAR**

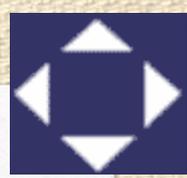


**FLOODING IN
THRACIA**



**DENSE FOG IN
ISTANBUL**





Technological Disasters



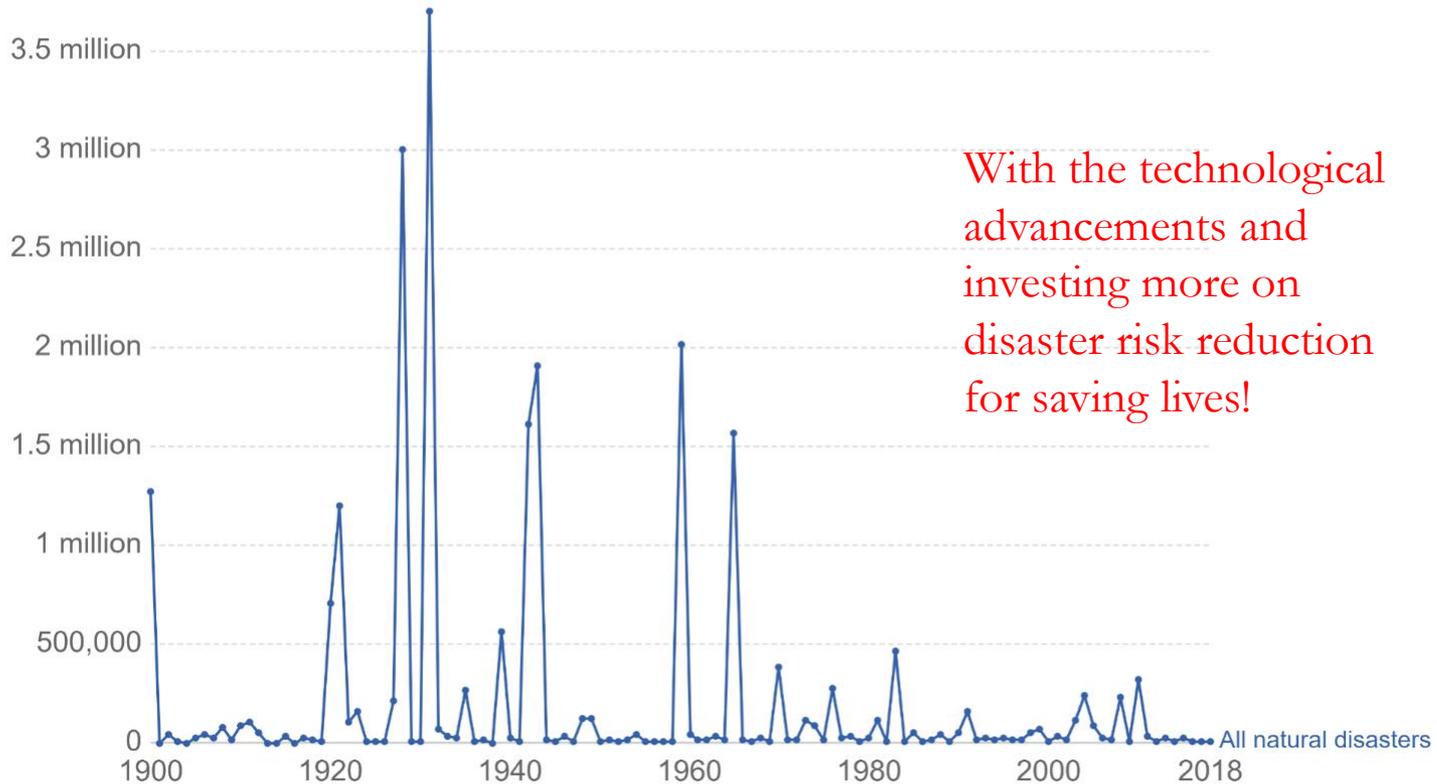


Doğal kaynaklı afetlerde yaşanan can kayıplarının yıllara göre değişimi (1900-2018)

Global deaths from natural disasters, All natural disasters

Absolute number of global deaths per year as a result of natural disasters. "All natural disasters" includes those from drought, floods, extreme weather, extreme temperature, landslides, dry mass movements, wildfires, volcanic activity and earthquakes.

OurWorld
in Data



Source: EMDAT: OFDA/CRED International Disaster Database, Université catholique de Louvain – Brussels – Belgium
OurWorldInData.org/natural-disasters/ • CC BY-SA

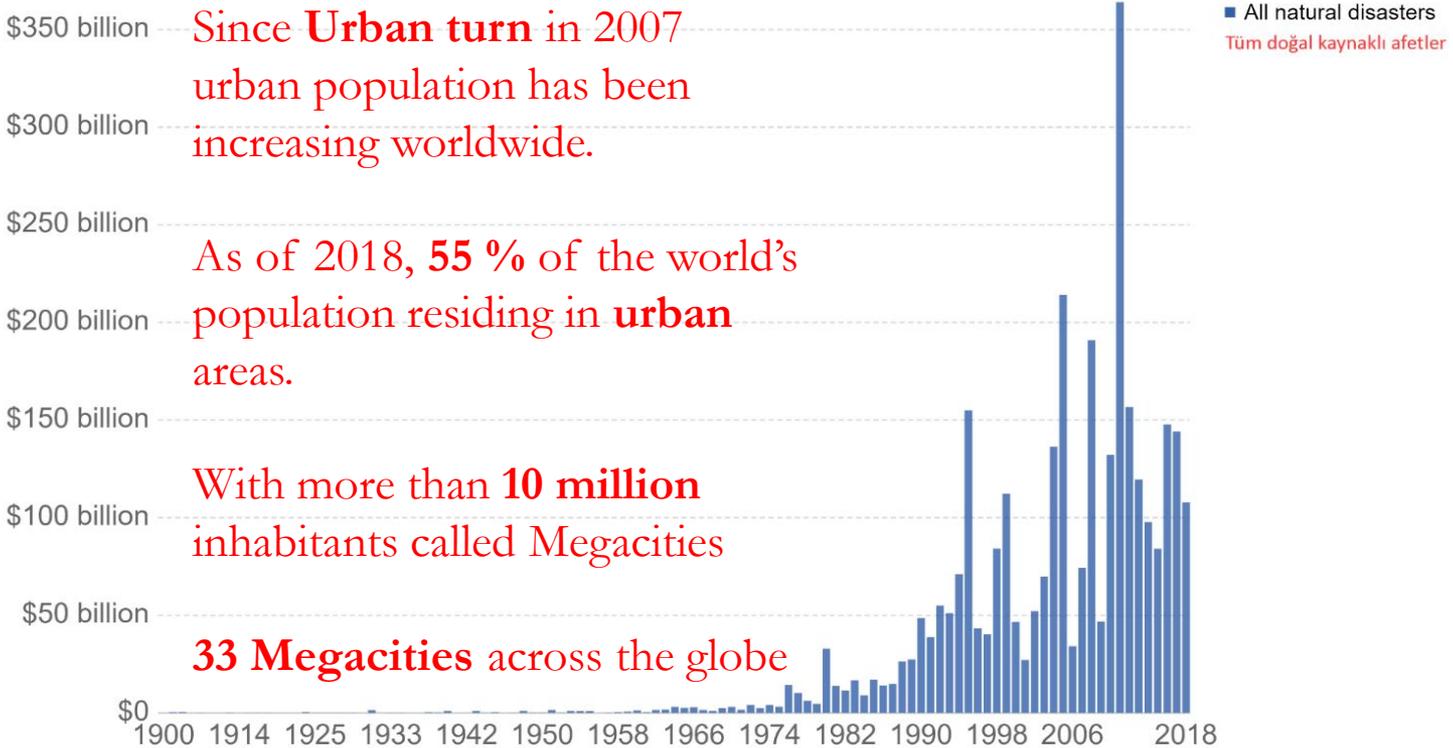


Doğal Kaynaklı Afetlerin Küresel Kayıp Maliyetlerinin Yıllara Göre Dağılımı

Global damage costs from natural disasters

OurWorld
in Data

Total economic cost of damages as a result of global natural disasters in any given year, measured in current US\$. Includes those from drought, floods, extreme weather, extreme temperature, landslides, dry mass movements, wildfires, volcanic activity and earthquakes.



Source: EMDAT: OFDA/CRED International Disaster Database, Université catholique de Louvain – Brussels – Belgium
OurWorldInData.org/natural-disasters • CC BY-SA

<https://population.un.org/wup/Publications/Files/WUP2018-KeyFacts.pdf>

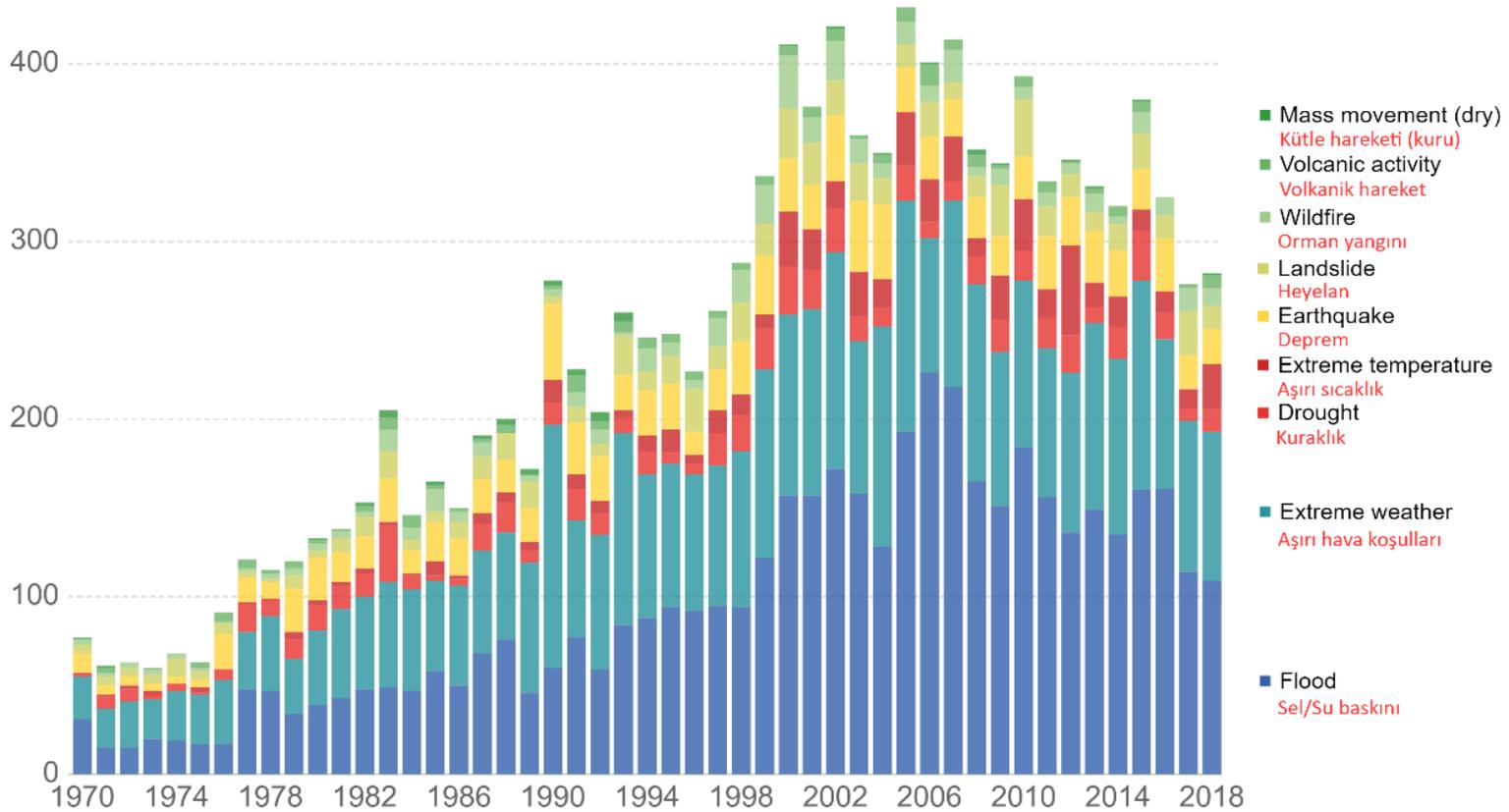


Küresel olarak kayda geçmiş doğal kaynaklı afetlerin çeşitlerine göre dağılımı (1970-2018)

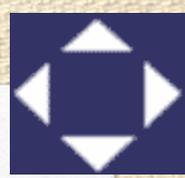
Global reported natural disasters by type

The annual reported number of natural disasters, categorised by type. This includes both weather and non-weather related disasters.

Our World
in Data



Source: EMDAT (2017): OFDA/CRED International Disaster Database, Université catholique de Louvain – Brussels – Belgium
OurWorldInData.org/natural-disasters • CC BY-SA

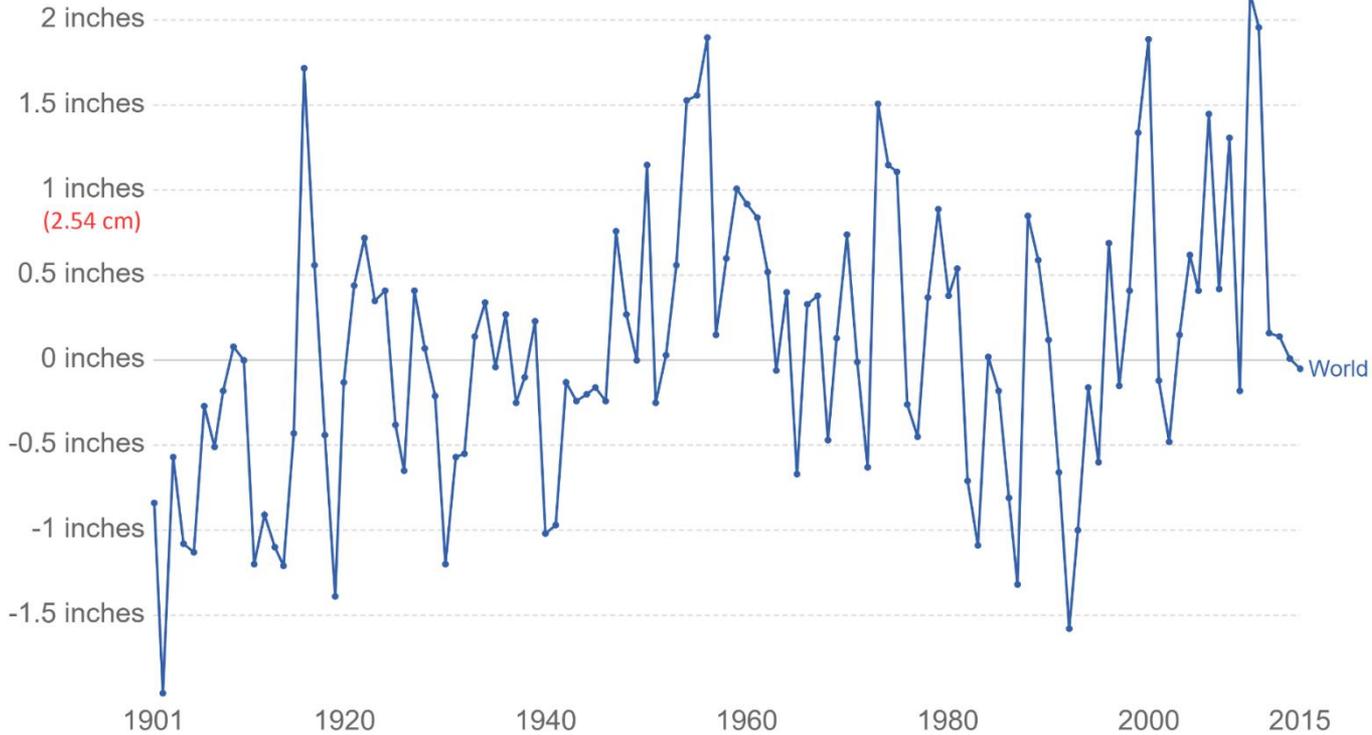


Küresel yağış anomalisinin yıllara göre değişimi

Global precipitation anomaly

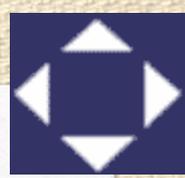
This indicator shows annual anomalies, or differences, compared with the average precipitation from 1901 to 2000 based on rainfall and snowfall measurements from land-based weather stations worldwide. Global anomalies have been determined by dividing the world into a grid, averaging the data for each cell of the grid, and then averaging the grid cells together.

Our World
in Data

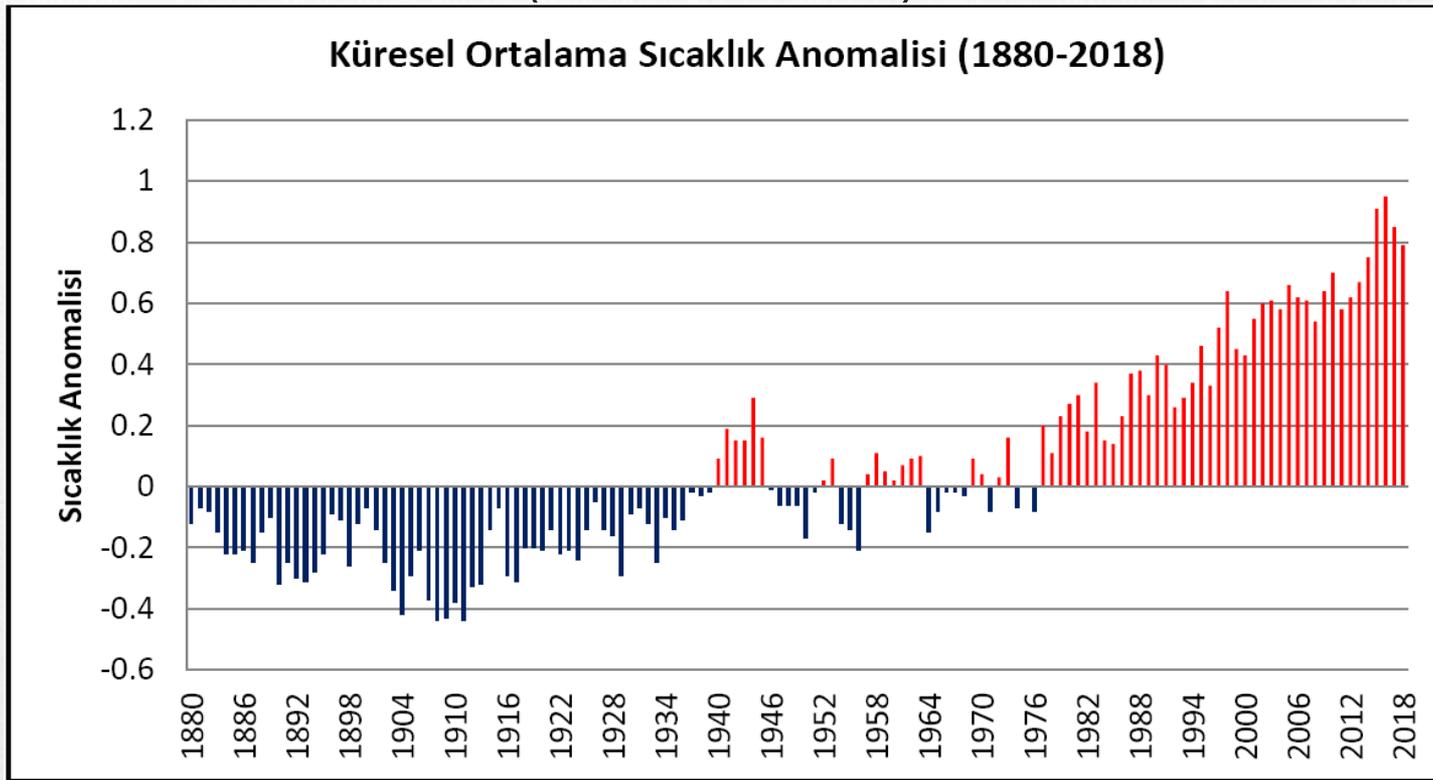


Source: National Oceanic & Atmospheric Administration (NOAA) via the US EPA

CC BY-SA



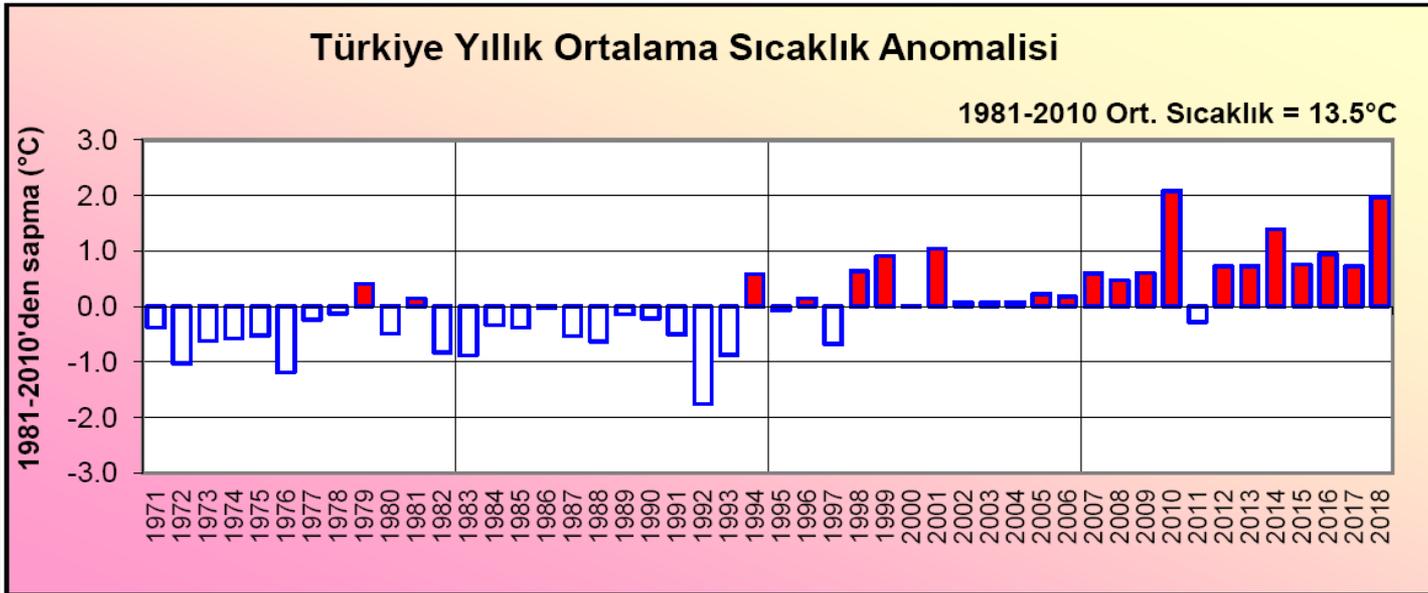
Global Mean Temperature Anomaly (1880-2018)



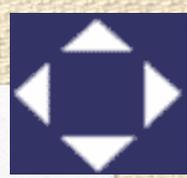
Source: <https://mgm.gov.tr/FILES/iklim/yillikiklim/2018-iklim-raporu.pdf>



Annual Mean Temperature Anomaly in TR



Kaynak: <https://mgm.gov.tr/FILES/iklim/yillikiklim/2018-iklim-raporu.pdf>

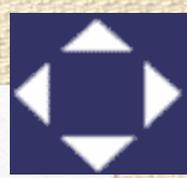


1999 Izmit Earthquake



2011 Van Earthquake





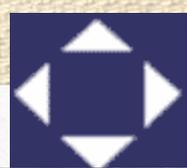
ALIBEYKÖY, İSTANBUL
19.08.2004
MİLLİYET



17.08.2004
ALIBEYKÖY, İSTANBUL
POSTA



GÜNEYDOĞU ANADOLU
2.11.2006
MİLLİYET

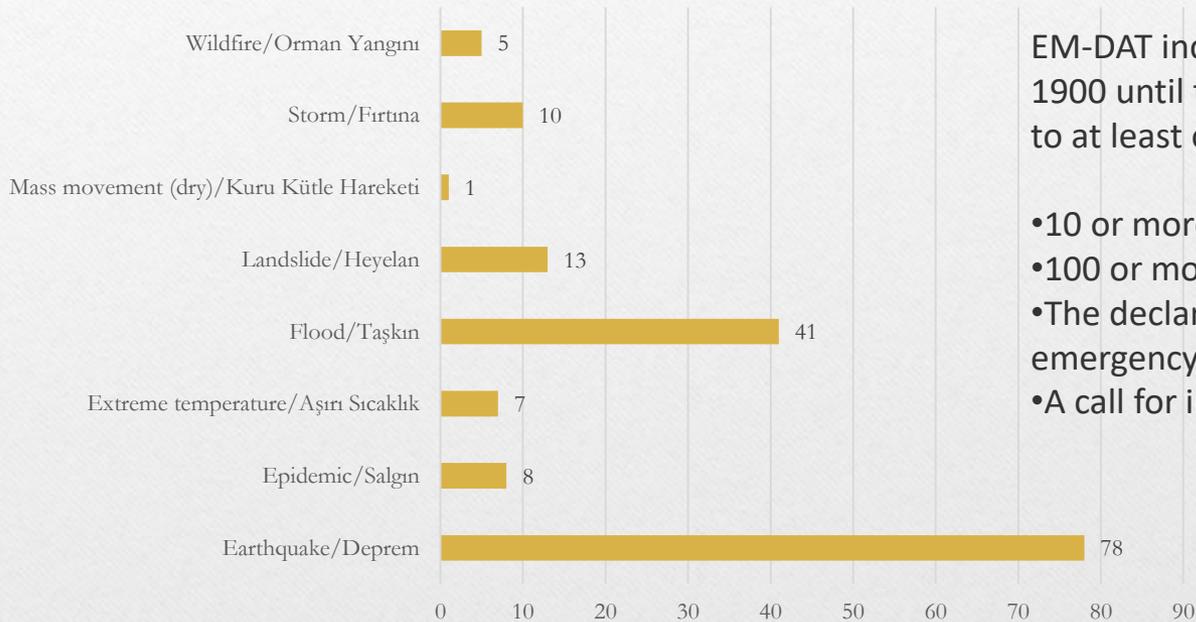


2018 ANTALYA





Naturally Driven Disasters in Turkey by type (1900-2019)



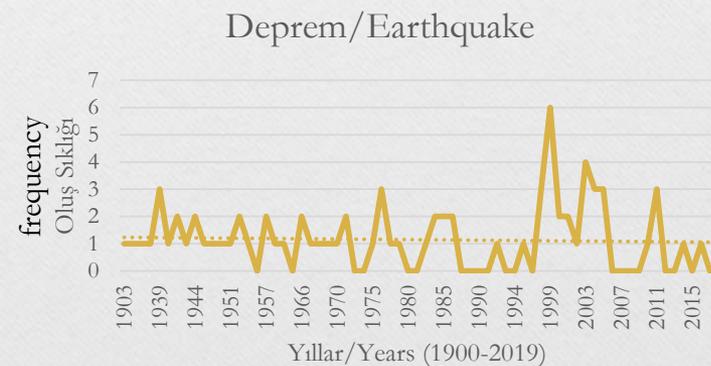
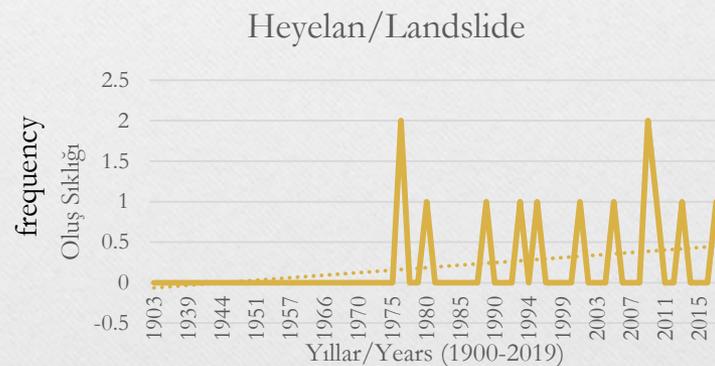
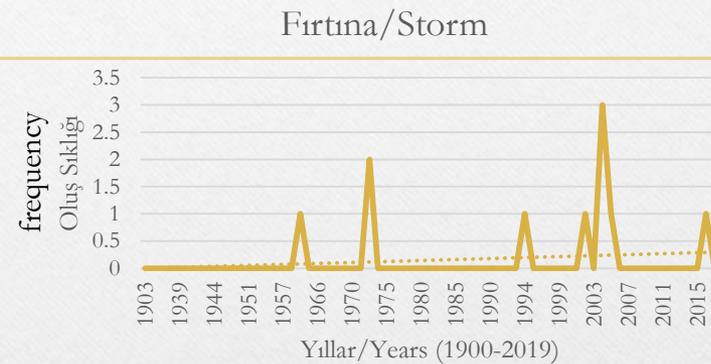
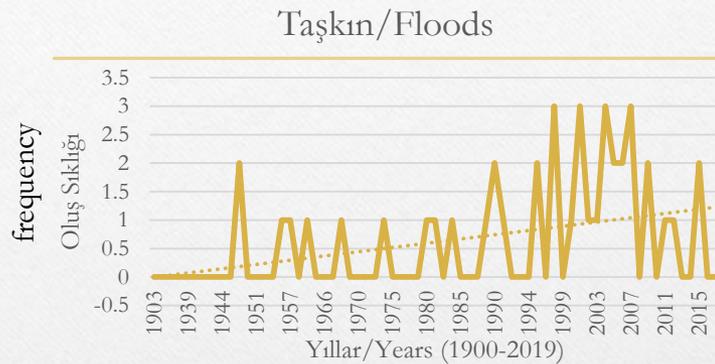
EM-DAT includes all disasters from 1900 until the present, conforming to at least one of the following criteria:

- 10 or more people dead;
- 100 or more people affected;
- The declaration of a state of emergency
- A call for international assistance

Source: EM-DAT: The Emergency Events Database - Universite catholique de Louvain (UCL) - CRED, D. Guha-Sapir - www.emdat.be, Brussels, Belgium



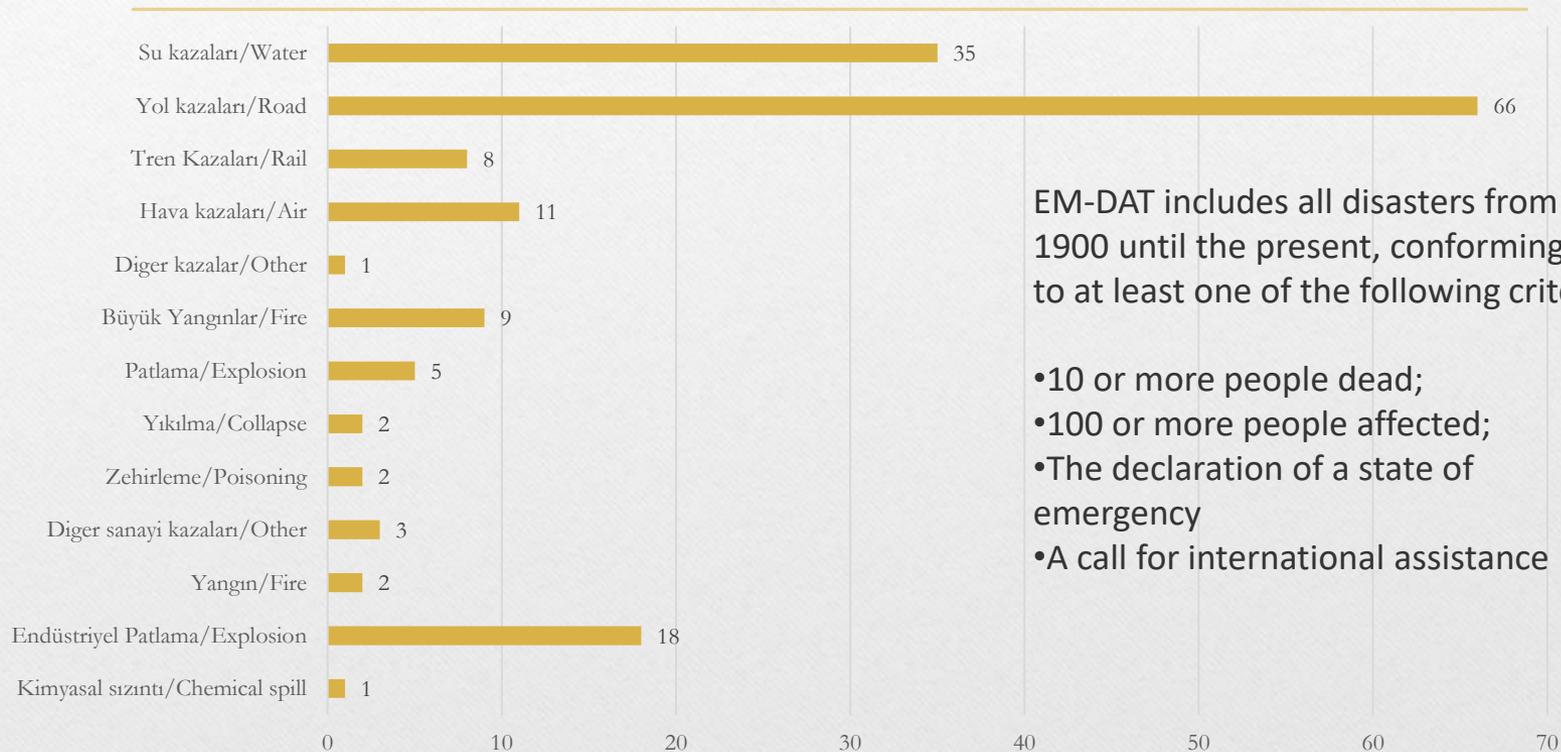
Naturally Driven Disasters in Turkey type by type (1900-2019)



Source: EM-DAT: The Emergency Events Database – Reproduced by the author.



Technologically Driven Disasters in Turkey by type (1900-2019)



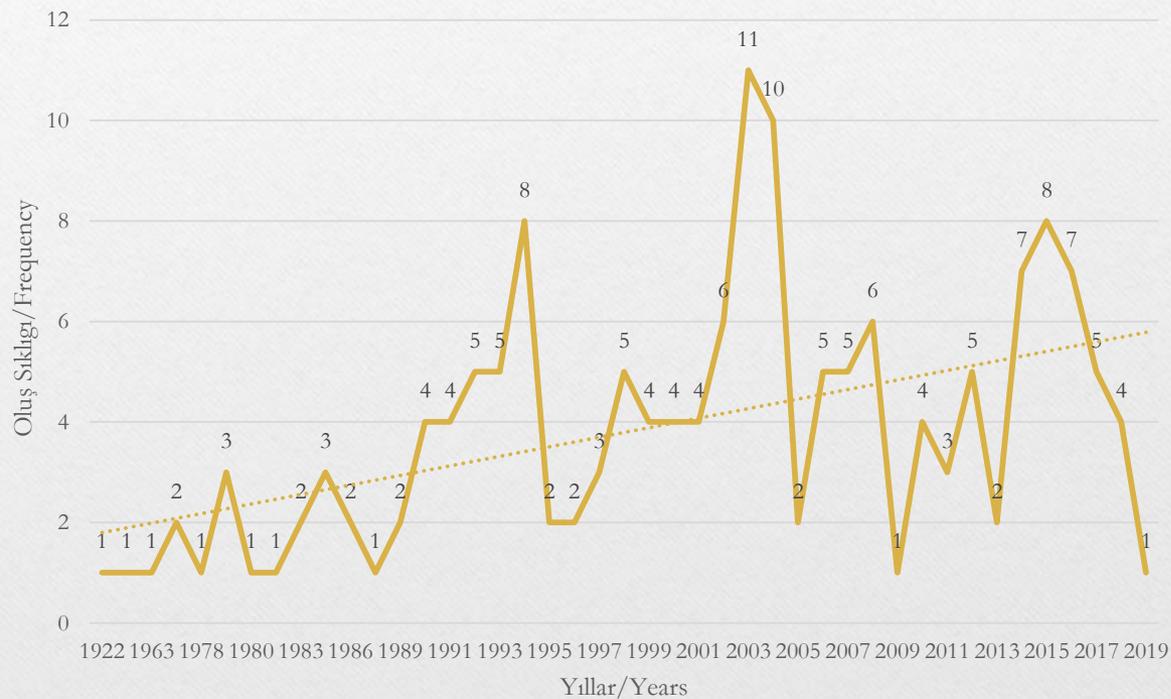
EM-DAT includes all disasters from 1900 until the present, conforming to at least one of the following criteria:

- 10 or more people dead;
- 100 or more people affected;
- The declaration of a state of emergency
- A call for international assistance

Source: EM-DAT: The Emergency Events Database - Universite catholique de Louvain (UCL) - CRED, D. Guha-Sapir - www.emdat.be, Brussels, Belgium



Trend in Technologically driven disasters (1900-2019)



Source: EM-DAT: The Emergency Events Database – Reproduced by the author.

Risk Concept in DM

The combination of the probability of an event and its negative consequences.

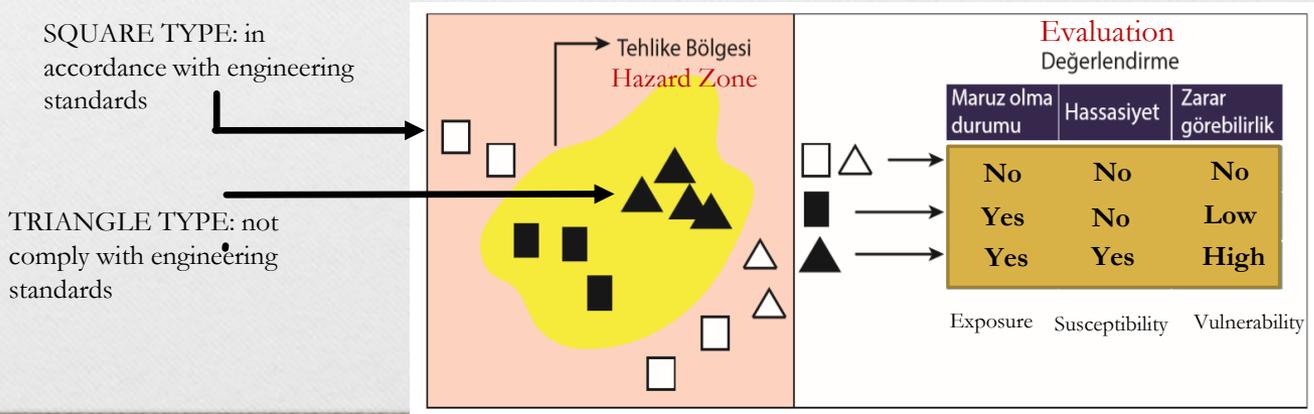
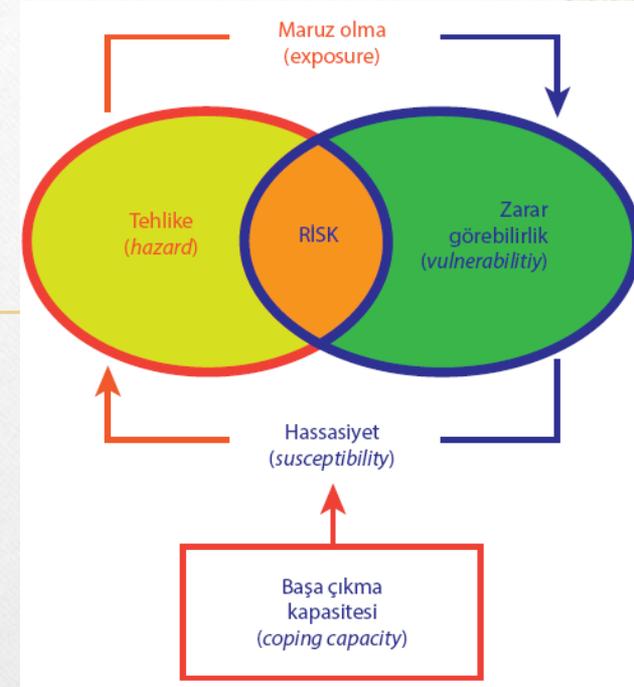
Risk is never equal to ZERO, if there is an asset which are vulnerable to any hazard!

But we could decrease it as much as possible to approach to zero by intervening vulnerabilities and coping capacities

Which could be possible by **disaster risk management**

$$\text{RISK} = \frac{\text{Hazard} \times \text{Vulnerability}}{\text{Coping Capacity}}$$

exposure
 susceptibility



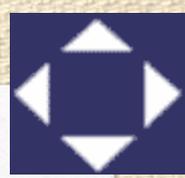


Events v.s. Disasters

- Events/incidences are natural and might not harmful at all but they turn into disasters due to human factor.
- Disaster Risk Management and Risk Reduction strategies show the ways to deal with disasters and to reduce possible damages before they occur.
- We are experiencing Climate Change these days a lot, so that in Turkey we should invest more on DRR strategies not only for earthquakes but also landslides, floods, avalanches and other meteorological induced disaster risks.
- Disaster Risk Management is the necessity since it provides;
 - systemic thinking and planning ability in order to understand and decrease uncertainties.
 - tools as scenarios for envisioning future uncertainties.
 - awareness among society by visioning scientific findings about future risks.
 - ways to implement policies for combatting possible effects on local population as being inclusive to most vulnerable groups as well.



METU Academics and their DRR activities



Earthquake Related Research and Education Components at METU

- Department of Civil Engineering
- Department of Earthquake Studies (interdisciplinary graduate program)
- Master of Earthquake Engineering and Engineering Seismology (Erasmus-Mundus Program)
- Earthquake Engineering Research Center
- Disaster Management Implementation and Research Center



Assoc. Prof. Nejan HUVAJ

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nejan@metu.edu.tr



RESEARCH INTERESTS

Geotechnical engineering, Slope Stability, Landslides, Unsaturated Soils, Experimental and Computational geomechanics, Uncertainty and Risk, Disaster Resilience, Ground improvement, Offshore geotechnical engineering, Onshore and offshore wind turbine foundations, Geotechnical Site Investigations, Problematic Soils

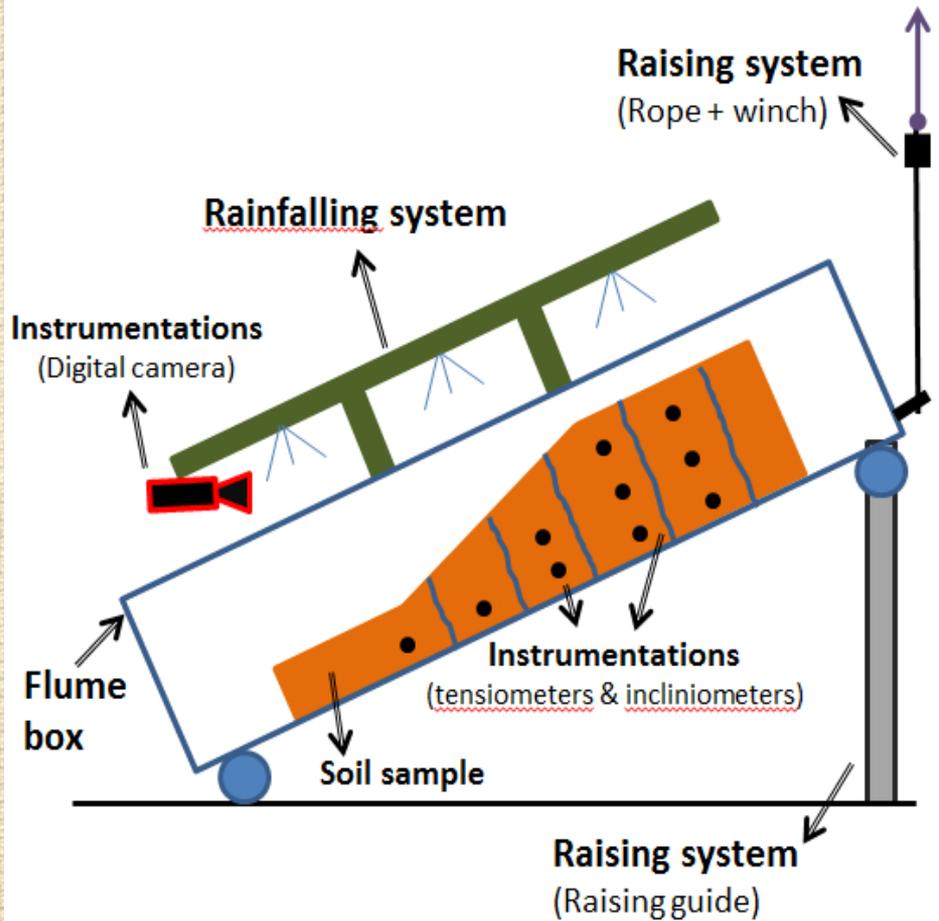


Duration	Title of Project	Funding Agency / Budget
2017-2020	Interaction of Marginal Fills and Geogrids for Reinforced Soil Walls and Slopes	Turkish Science and Technological Council (TUBITAK) CAREER Grant 3501 / Budget: 369.370 ₺, approx. 60,000 €
2010-2013	Mechanism and Modeling of Slow Moving Landslides	European Commission EC Marie Curie grant no: FP7-PEOPLE-2009-RG-249186-FOLADIS / 75,000 €
2010-2013	Rainfall triggered landslides in unsaturated soils	Turkish Science and Technological Council (TUBITAK) 1001 Grant / Budget: 328.304 ₺, approx. 55,000 €
2010-2011	Stability and Disasters in Mine Tailing Dams	Middle East Technical University Internal Grant

2010-2013

Rainfall triggered landslides in unsaturated soils

Turkish Science and Technological Council (TUBITAK) 1001 Grant / Budget: 328.304 ₺, approx. 55,000 €







Rainfall-triggered landslides in
Rize, Turkey, 2010



Rainfall-triggered landslides in Rize, Turkey, 2010

Landslides and Early Warning Systems

<https://www.youtube.com/watch?v=aESuJIAIpeU&feature=youtu.be>



YouTube TR Search

One of the most critical things that we could do to prevent this damage is to give early warning

0:00 / 2:39

Heyelanlar ve Erken Uyarı Sistemleri / Landslides and Early Warning System

2,252 views • Feb 22, 2016

22 0 SHARE SAVE ...

Middle East Technical University
12.5K subscribers

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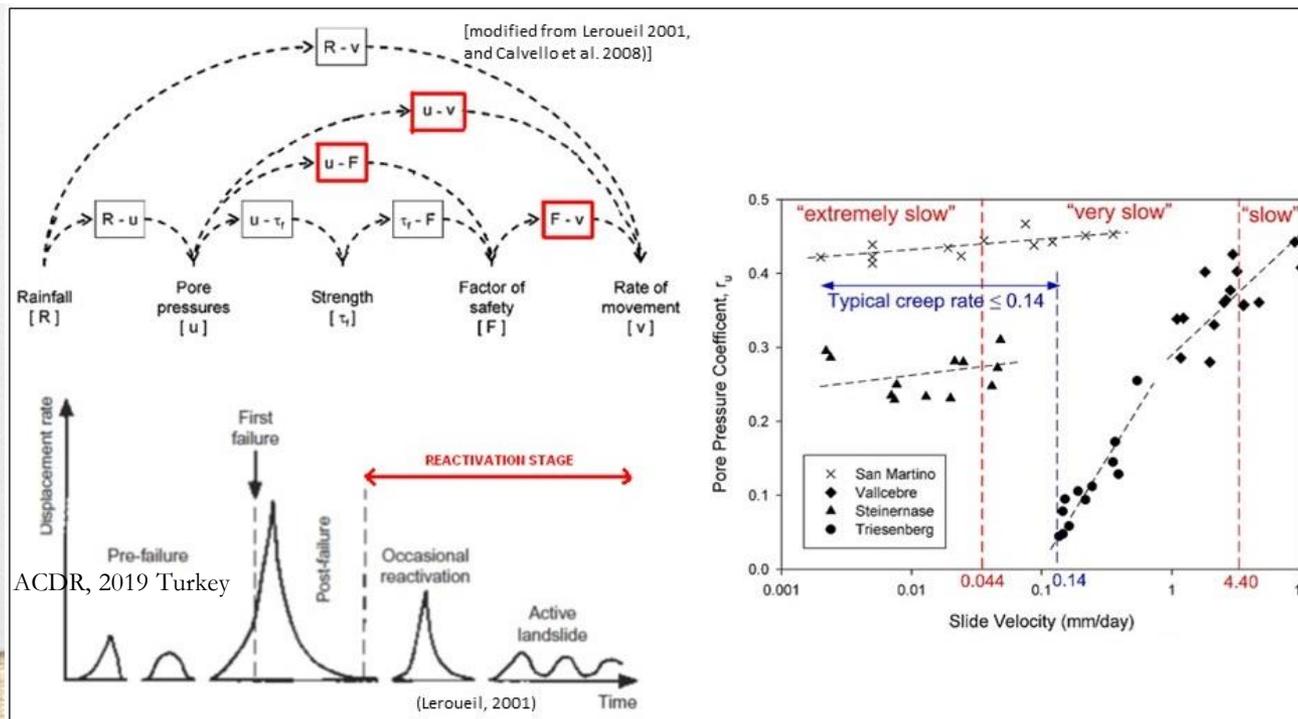
"Ülkemizde, özellikle eğitimli yerlere yapılaşma arttığından heyelanların yol açtığı hasarlar da artmakta."

ACDR, 2019 Turkey

Project objectives:

The overall goal of this research is to reduce damage and loss of life caused by landslides, by increasing our understanding of the mechanism of landslides, and modeling and forecasting techniques. The specific objectives of the research are:

- 1) to identify the triggering factors and failure mechanisms in landslides composed mainly of (or dominated by) cohesive soils,
- 2) to investigate application of numerical models in slope displacement analyses and calibration of model parameters by observed deformations in well-documented case histories.
- 3) to establish threshold slope displacement rates that can be used in setting up alarm levels and early warning, and to improve forecasting methods and tools that would help predict the time of a possible catastrophic landslide,
- 4) to transfer the knowledge to end-users including practising engineers by preparing handbooks/guidelines and training courses.

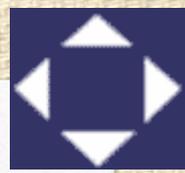


Mine tailing disaster in Hungary - Oct 4, 2010

Consequences: 10 people died, 120 injured, 7 villages and towns (7000 people) affected. It swept cars from roads, damaged bridges and houses, destroyed livestock, and forced the evacuation of hundreds.

Trigger: Weeks of heavy rain.





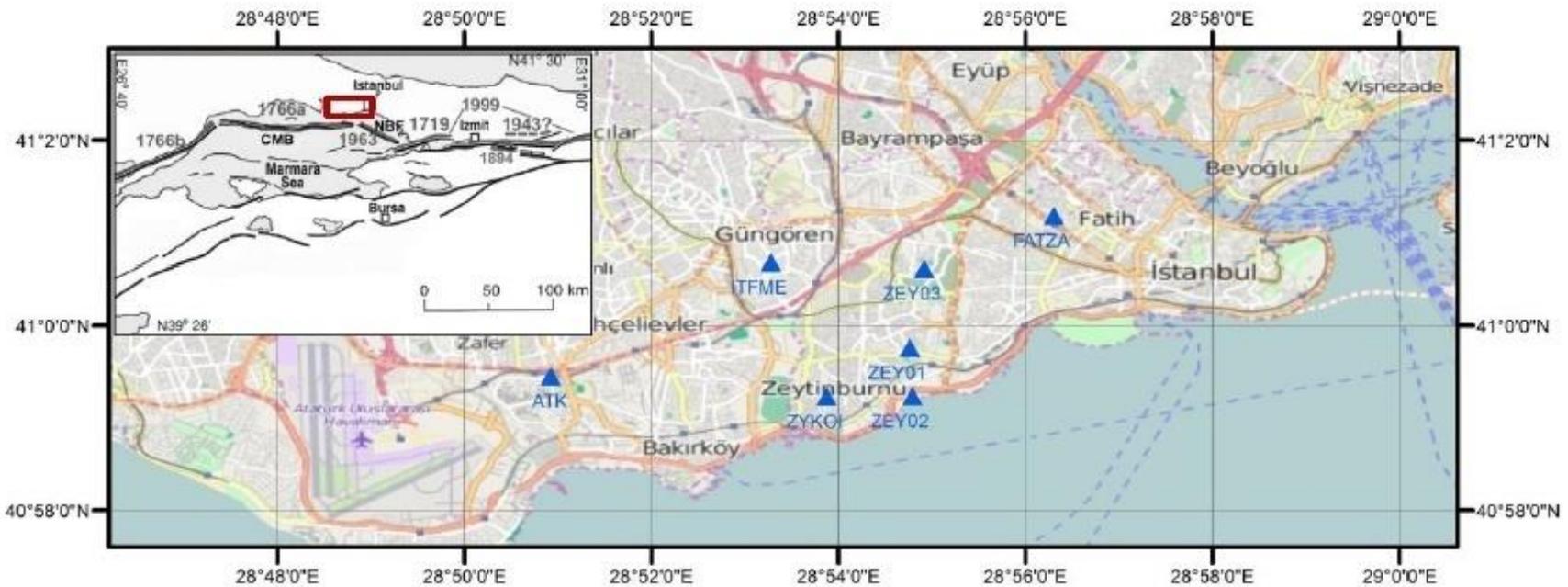
Prof. Dr. Ayşegül ASKAN GÜNDOĞAN,
METU Civil Engineering Dept. Ankara
Email: aaskan@metu.edu.tr

Earthquake Engineering: Collaborations and Related Projects

- Japan MEXT Project, 2015-2020. “Japan-Turkey Cooperative Education Program on Resilience Engineering for Energy and Urban Systems (JTRE)”. <http://jtre.t.u-tokyo.ac.jp/>
- (Turkish-Japanese) SATREPS MarDiM Project, 2013-2018. “Earthquake and Tsunami Disaster Mitigation in the Marmara Region and Disaster Education in Turkey”. <http://www.mardimproject.org/>
- Turkish Geophysical and Geodesy Union (TUJJB) Project, 2011- 2015. “Estimation of Potential Seismic Losses in Erzincan (Turkey)”
- Earthquake Model of the Middle East- EMME Project, 2010- 2014. “Host-to-target ground motion scalings between Georgia, Turkey and Iran”
- EU NERA (Network of European Research Infrastructures for Earthquake Risk Assessment and Mitigation) Project 2010- 2014.
- TUBITAK 1002 Project, 2009-2010. “Estimation of Dynamic Properties of Soils with MMSPAC (Multi-Mode Spatial Autocorrelation Method) in Urban Areas”.

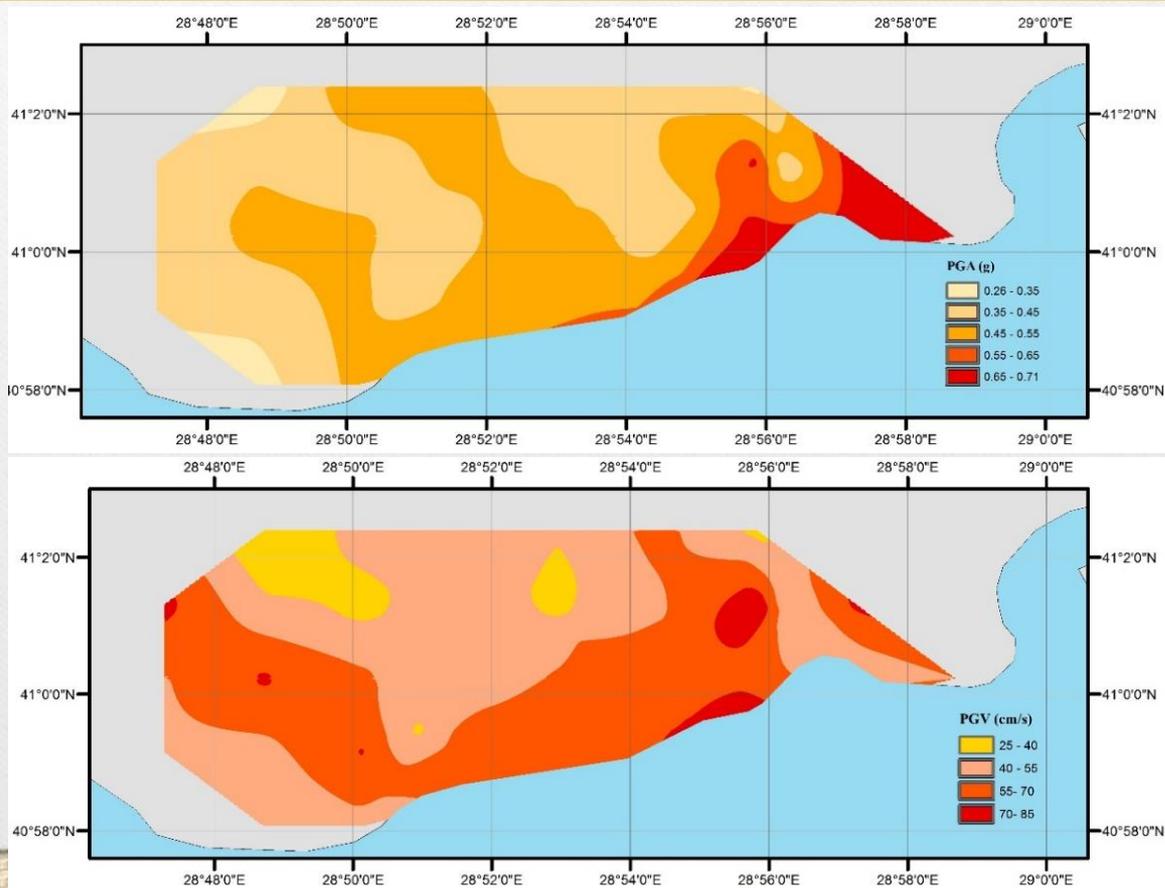


Broadband Ground Motion Simulations in Istanbul, Turkey SATREPS MARDIM PROJECT (2013-2018): (2nd project in the list)



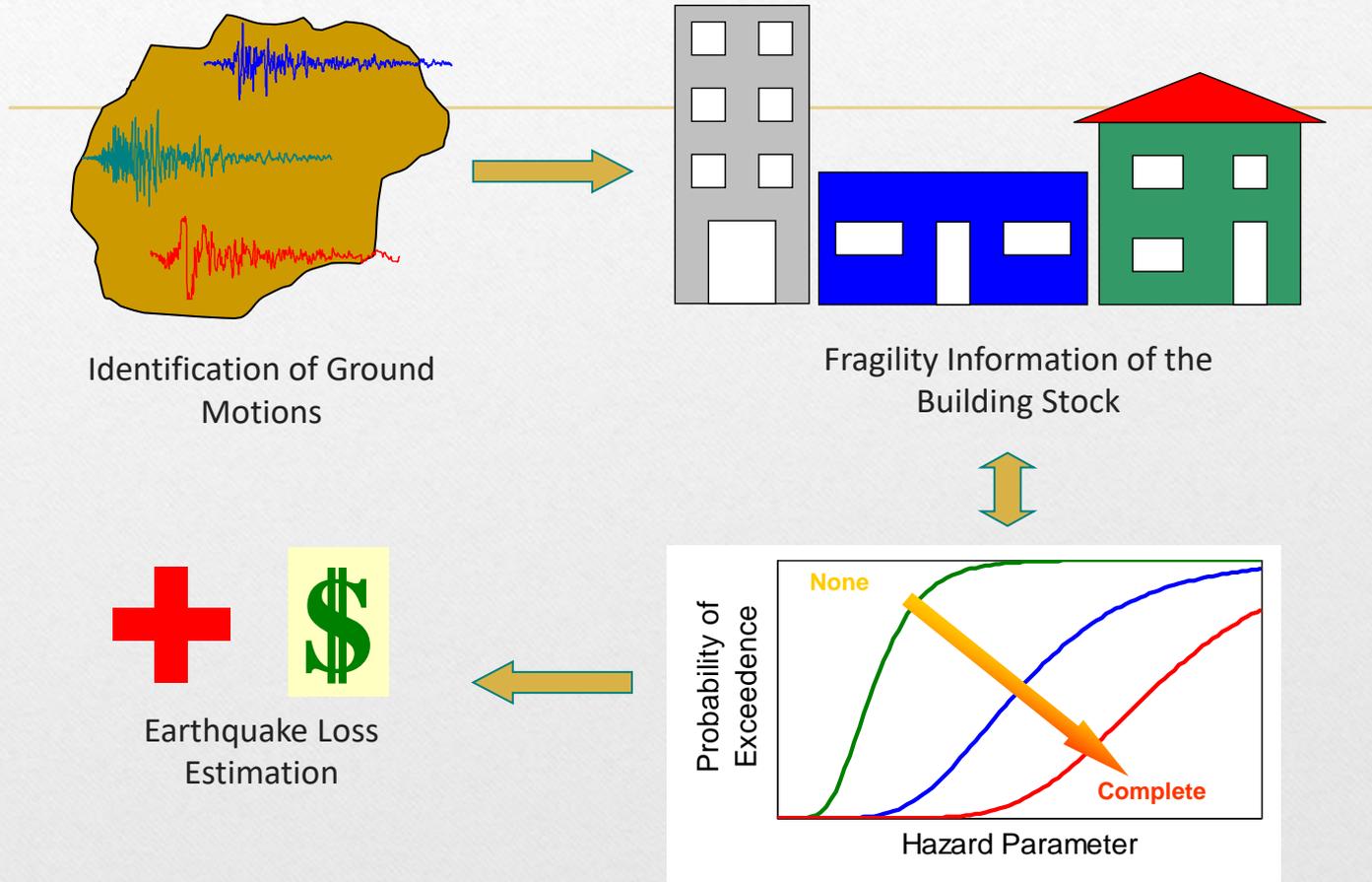


Broadband Ground Motion Simulations in Istanbul, Turkey SATREPS MARDIM PROJECT (2013-2018): (2nd project in the list)



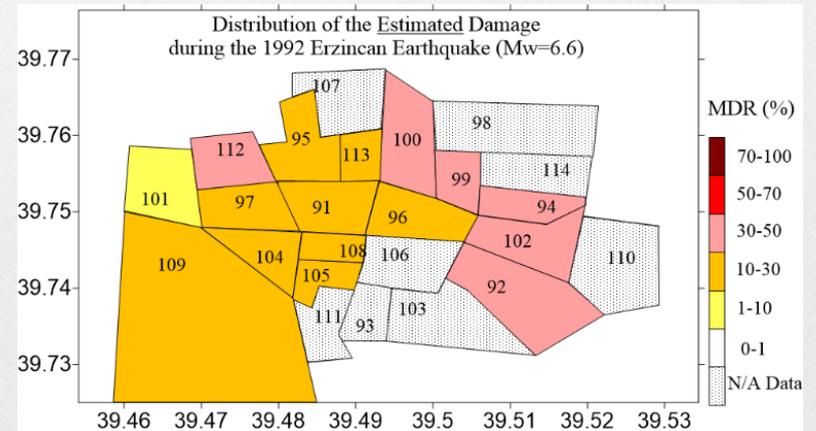
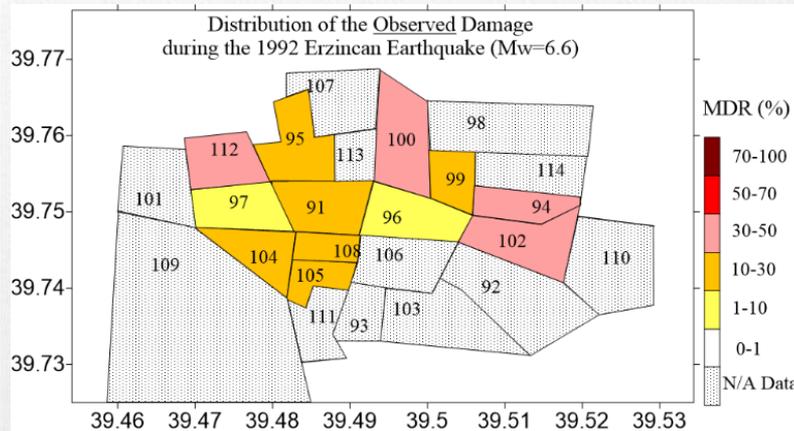


Multi-component Loss Estimation Models (3rd project in the list)





Multi-component Loss Model: Comparison of observed and estimated damages in 1992 Erzincan Eq



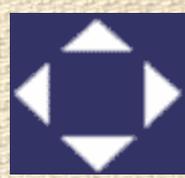


Prof. Dr. Ahmet Cevdet YALÇINER
Dept. of Civil Engineering
Ocean Engineering Research Center, METU
Email: yalciner@metu.edu.tr
<http://users.metu.edu.tr/yalciner/>

A distinguished researcher actively studying on tsunami science since 1987. He has made valuable contributions to tsunami science in terms of **tsunami numerical modeling, increasing tsunami awareness, preparedness, resilience, and development of mitigation strategies through countless international scientific projects.**

He was selected as the Research Fellow of Matsumae International Foundation of Japan in 1987, which provided a great opportunity for him to study at Tohoku University under the supervision of Prof. Dr. Nobuo Shuto. He devoted not only his academic endeavors but also his life to the protection of coastal communities against tsunamis, storm surges, and marine induced hazards. He had led numerous post-tsunami survey teams of UNESCO since 2004 and chaired UNESCO-IOC NEAMTWS between 2013 and 2017.





Middle East Technical University

Disaster Management Implementation and Research Center (DMC)

DMC Website: www.dmc.metu.edu.tr

E-mail: dmc@metu.edu.tr

(est. 1997)

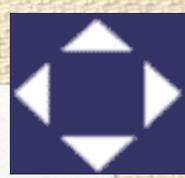
Tel: +90 (312) 210 5410/5427

Fax: +90 (312) 210 1328



DMC

- Established in November **1997**
- First Disaster Management Centre within academia
- Under the UNDP cost-sharing project in order for «the improvement of Turkey's Disaster Management System»



STEERING COMMITTEE

Assist. Prof. Dr. Bekir Özer AY

Department of Architecture

Prof. Dr. Özlem ÖZDEMİR,

Department of Business Administration

Assist. Prof. Dr. Meltem ŞENOL BALABAN (Director),

Department of City and Regional Planning

Prof. Dr. M. Altuğ ERBERİK,

Department of Civil Engineering

Assist. Prof. Dr. Arda ÖZACAR ,

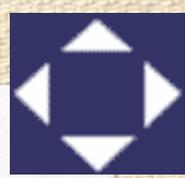
Department of Geological Engineering

Prof. Dr. Sibel KALAYCIOĞLU,

Department of Sociology

Assoc. Prof. Dr. B. Burçak BAŞBUĞ ERKAN (on leave, previous director)

Department of Statistics



Objectives:

- Provides consultancy and project support to national and international institutions, with a multidisciplinary approach for mitigation of disasters caused by natural and man-made events.
- Offers seminars, training courses, in-service training to officials or to community groups within the framework of disaster risk management.
- Conducts research, implementation and improvement activities about disaster risk management.
- Since from the beginning, organizes scientific and professional meetings (e.g. Annual Round Table Meetings) regularly for disaster related issues, legislation and actual implementational problems and recently risk management approaches.



METU-DMC

ANNUAL ROUND TABLE MEETINGS (RTM)

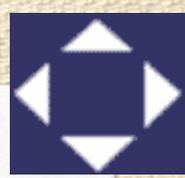
- ✓ **22.RTM** **12 February 2020**
- ✓ **21. RTM** **22 February 2019**
-
- ✓ **12. RTM** **15 January 2010**
- ✓ **11. RTM** **16 January 2009**
- ✓ **10. RTM** **11 January 2008**
- ✓ **9. RTM** **12 January 2007**
- ✓ **8. RTM** **20 January 2006**
- ✓ **7. RTM** **7 January 2005**
- ✓ **6. RTM** **16 January 2004**
- ✓ **5. RTM** **28 March 2003**
- ✓ **4. RTM** **21 December 2001**
- ✓ **3. RTM** **19 January 2001**
- ✓ **2. RTM** **16 December 1999**
- ✓ **1. RTM** **4 December 1998**





METU-DMC ANNUAL ROUND TABLE MEETINGS (RTM)

- All day long meetings with different thematic groups like pshyco-social studies, engineering solutions, urban planning issues, social aspects of disasters and so on.
- Spectrum of disciplines is wide from natural sciences to social sciences since disaster risk management field has multi-disciplinary approach
- Open to all stakeholders from governmental institutions, academia to NGOs, S&R Teams and initiatives
- Discussion forum and final outcomes of the annual meeting to communicate with decisionmakers!

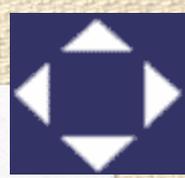


Some recent activities/projects

1. Project on K.Maraş City as a case for Developing Provincial Risk Reduction Plan with AFAD (Disaster and Emergency Management Presidency) *Ongoing*
2. Third Country Training Program on Disaster Risk Management and Building Disaster Resilient Communities (TCTP) 2017 - 2019
3. Global Academic Network on Disasters (GAND) membership (2015) and GAND 2016 Meeting at METU
4. Consultancy for Istanbul Greater Municipality for Social Aspects of Disaster Risk in Istanbul (2015)
5. Turkish Parliament Investigation Committee advisory on Soma Mining Disaster, 13 May 2014
6. METU campus: ready for disaster and emergencies: Case of METU library in 2014 and Dormitories in 2015
7. Disaster Management Terminology Dictionary by AFAD
8. EU project 'TACTIC' for resilient communities (2014-2015)
9. 'Turkish Disaster Data Bank' for the Turkish Disaster and Emergency Management Authority, October 2012-April 2014
10. Online Disaster Management Courses (since 2007, currently on revision)

Some topics of training:

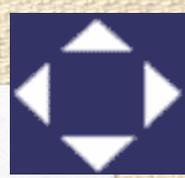
1. Principles of Comprehensive DRM
2. Community based DRM
3. Hazard Hunt
4. Structural and Non-structural risk mitigation
5. Psycho-social training
6. Financial risk reduction on disaster losses
7. Catastrophe insurance / TCIP
8. Architectural overview of DRM
9. Damage assessment
10. Disaster statistics
11. Media communications
12. Flood risk analysis/planning
13. Sustainable development



TCTPs

(Third Country Training Programme)

- Middle East Technical University (METU), Turkish Cooperation and Coordination Agency (TIKA) and Japan International Cooperation Agency (JICA) signed an agreement in January 4, 2017 to start international cooperation project, called “**Third Country Training Program on Disaster Risk Management and Building Disaster Resilient Communities**”.
- The project aims to share the Turkish experiences related to disaster management with other disaster prone countries such as Pakistan, Myanmar, Bangladesh, Philippines and Japan.
- The duration of the project is from 2017 to 2019 (3 years) and the training programs have been mainly based at METU in Ankara but several training visits conducted in Bursa, Düzce and İstanbul.



The Aim of TCTP

- This training program aims to provide attendees the key knowledge related to effective reduction of disaster risk and management of disasters by the Turkish experts through JICA-METU collaboration that has been going on since more than a decade and it is enriched with TİKA's expertise in knowledge transfer in the field of disaster risk management. Academicians from various departments working with the Disaster Management Implementation and Research Centre (METU DMC) as well as supporting universities and NGOs have participated during the all training periods.
- Specifically, the trainees from Bangladesh, Myanmar, Pakistan and Philippines are accepted to the training. Every year, a different group of participants, 3 participants per country are selected from highly related organizations and disciplines (**35 trainee in total**).

TCTP Participants	2017	2018	2019
Number of Participants	12	11	12
Age Average	37	37.5	38.2
Female - Male	3 F – 9 M	4 F – 7 M	5 F – 7M
Education Levels	3 BSc, 6 MSc, 3 PhD	3 BSc, 6 MSc, 2 PhD	3 BSc, 7 MSc, 2 PhD
Profession	Civil Engineering Geology, Medical Tech., Economics, Finance, Psychology	Civil Engineering, Earthquake Eng, Disaster Management, Electrical Eng, Economics, Urban Planning, Public Policy, Computer Eng, Software Eng	Zoology, Disaster Mitigation, Defense and Strategic Strategies, Geological Eng, Mathematics, Seismology, Commerce, Accounting, Fire Science and Tech., Process Eng, Electronics and Communications Eng, Banking and Finance and Public Administration

TCTP Participants	2017	2018	2019
Organizations	<p>Min. of Disaster Management and Relief, Dept. Disaster Science and Management, Dagon Uni. Dept. of Geology, Dept. of Meteorology and Hydrology and Seismology Div, NDMA, Provincial Gov. City Gov. Legislative Dept., Resilience Institute</p>	<p>Min. of Disaster Management and Relief, Dept. of Meteorology and Hydrology and Seismology Div, Irrigation Dept., Civil Defense, UET Peshawar, National Economic and Development Authority, City Gov., Uni Dhaka,</p>	<p>NDMA, UET Peshawar EQ Eng Center, Yadanabon Uni Dept. Geology, Dept. of Meteorology and Hydrology and Seismology Div, Min. Education, Min. of Transport and Com. Min. of Agriculture, Livestock and Irrigation, Fire Service and Civil Defense Directorate, Local gov, Office of Civil Defence, Uni of Dhaka</p>
Related Duties	<p>DRR, Vulnerability assessment, Flood and river bank modelling, GIS and remote sensing, heritage preservation, Landslide susceptibility, Life support training, social vulnerability</p>	<p>EQ monitoring, data processing, Seismic resilience for critical infrastructure, Construction of embankments, risk reduction using sensors, shelter design, flood vulnerability assessment</p>	<p>Seismic risk assessment, EQ monitoring data processing, Disaster drills training, Liquefaction, Post EQ initial situation assessment, rehabilitation of polder embankments, disaster coordination center, DRRM and technical assistance</p>



Lectures and Field Trips

- Lectures have been delivered at METU campus in Ankara in classroom and face-to-face by the very capable and experienced academic staffs. There were several field trips to Kaynaşlı, Düzce and to Bursa to observe Disaster Training Center, Bursa AFAD and Inegol Landslide Area, as well as to Istanbul for visiting major coordination center in Hasdal AFAD and an earthquake retrofitting sites (e.g. Göztepe Hospital in 2017, 2019, Munis Faik Middle School in 2018) and an earthquake reconstruction site of Kadıköy Atatürk Fen Lisesi (*High School*) in 2019).

ANKARA



BURSA



ANKARA



İSTANBUL







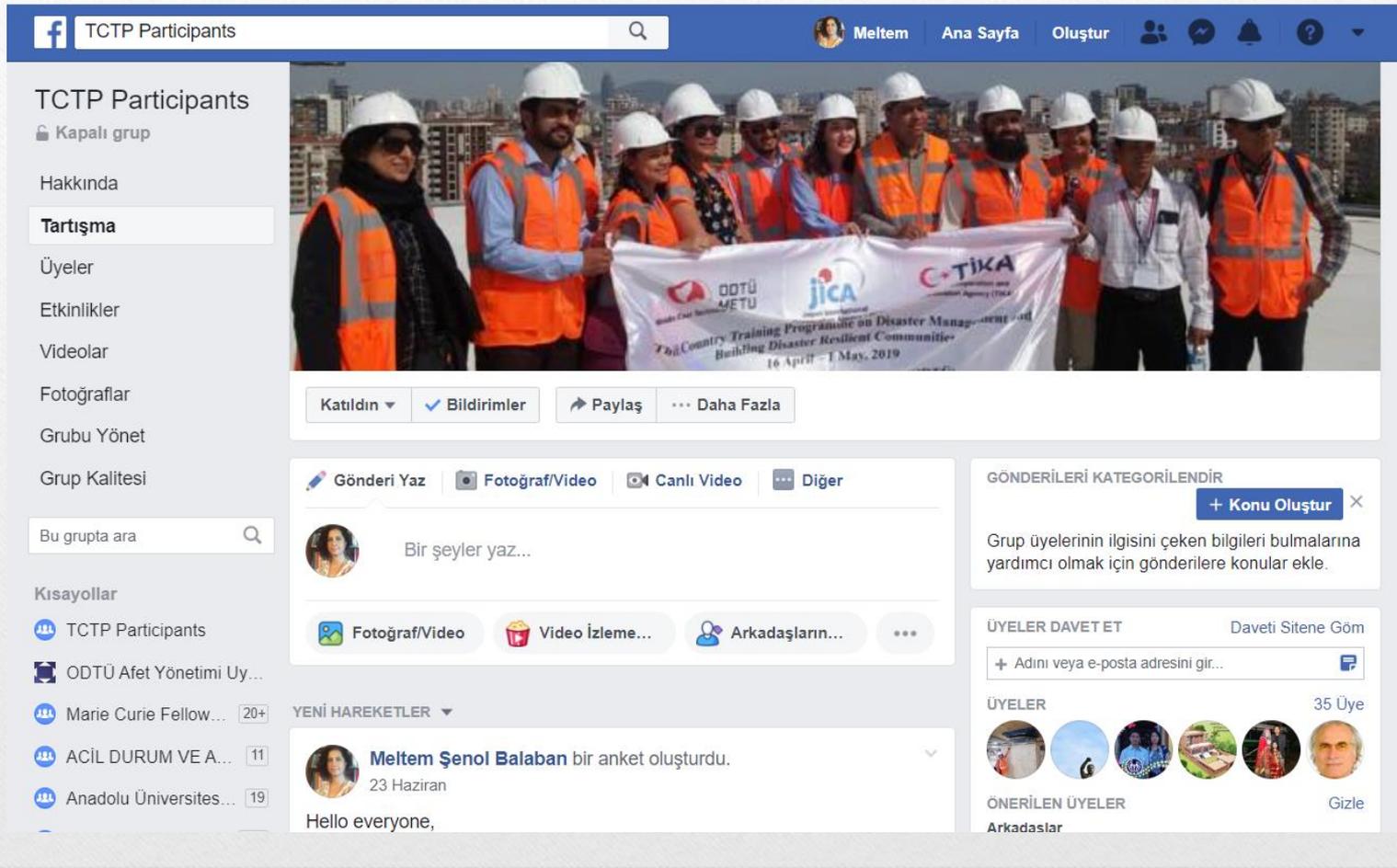
Feedbacks from participants

Most of the participants found very valuable and some of them have already launched similar implementations that have learned through the training period in Turkey.

- Most of the participants found necessary to have Disaster Training Centers in their countries like in Japan and Turkey since those facilities are critical to provide assistance in activities regarding training, awareness raising, preparedness and building resilience in communities.
- Participants from 2017 for instance;

In Philippines the participants initiated similar activities as described by Turkey's response system that is directed by AFAD in Bohol City. They also established command and control centers at located 5 strategic locations. Besides, they have an initiative to open a Graduate Program on DRR and DRM in one of the State Universities of Philippines.

What are the end-products?



The image shows a screenshot of a Facebook group page titled "TCTP Participants". The group is a closed group. The main content area features a large photo of a group of people wearing orange safety vests and white hard hats, holding a white banner. The banner has logos for ODTÜ METU, JICA, and TİKA, along with text: "7th Country Training Programme on Disaster Management and Building Disaster Resilient Communities, 16 April - 1 May, 2019". Below the photo are buttons for "Katıldın", "Bildirimler", "Paylaş", and "Daha Fazla".

The left sidebar contains navigation options: "Hakkında", "Tartışma", "Üyeler", "Etkinlikler", "Videolar", "Fotoğraflar", "Grubu Yönet", and "Grup Kalitesi". There is also a search bar for the group and a list of "Kısayollar" (shortcuts) including "TCTP Participants", "ODTÜ Afet Yönetimi Uy...", "Marie Curie Fellow...", "ACİL DURUM VE A...", and "Anadolu Üniversites...".

The main content area below the photo shows a post by "Meltem Şenol Balaban" dated "23 Haziran". The post text is "Hello everyone,". Above the post are buttons for "Gönderi Yaz", "Fotoğraf/Video", "Canlı Video", and "Diğer". To the right of the post are sections for "GÖNDERİLERİ KATEGORİLENDİR" (with a "+ Konu Oluştur" button), "ÜYELER DAVET ET" (with a "Daveti Sitene Göm" button and a search bar), "ÜYELER" (showing 35 members), and "ÖNERİLEN ÜYELER" (with "Arkadaşlar" below).



“Spatialization of natural and man-made hazards on UNESCO World Heritage Sites in Turkey” *Ongoing*

METU Scientific Research Project

Project Code: YÖP-202-2018-2853

Asst. Prof. Dr. Meltem ŞENOL BALABAN (project coordinator)

Res. Asst. PhD Candidate Aynur ULUÇ (researcher)



United Nations
Educational, Scientific and
Cultural Organization



World
Heritage
Convention

Why to study UNESCO World Heritage Sites?

Being a part of **national** and **community pride** and **social cohesion**, World Heritage Properties are significant. Within the World Heritage Convention, States Parties have to preserve those properties for future generations. Accordingly, managers have to conserve those properties with their outstanding universal value (UNESCO, 2010: 8).



United Nations
Educational, Scientific and
Cultural Organization



World
Heritage
Convention

Why UNESCO World Heritage Sites (WHS)?

UNESCO WHS are prone to several natural and man-made (technological) hazards that might negatively affect their **integrity** and **values**. When they're affected/damaged, national and local communities are highly affected since they possess **cultural values for their identity, socio-economical values as well as their historical values as being sources of history** (UNESCO, 2009).

Cultural Sites/Structures:16

•Archaeological site: 9

Efes I Hattuşa: Hitit Başkenti I Ani Archaeological Site I Troya Antik Kenti I Çatalhöyük Neolitik Kenti I Xhantos-Letoon I Afrodissias I Nemrut Dağı I Göbeklitepe

•Urban site: 5

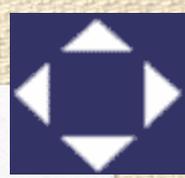
Bergama Çok Katmanlı Kültürel Peyzaj Alanı I Diyarbakır Kalesi ve Hevsel Bahçeleri I Safranbolu Şehri I Bursa ve Cumalıkızık: Osmanlı İmparatorluğu'nun Doğuşu I İstanbul Tarihi Alanları

•Monumental Structure: 2

Selimiye Camii ve Külliyesi I Divriği Ulu Cami ve Darüşşifası I

Mixed Sites:2

Pamukkale-Hierapolis I Göreme National Park and Cappadocia



Major Steps for the project:



United Nations
Educational, Scientific and
Cultural Organization



World
Heritage
Convention

To create baseline and problem definition by literature survey (prepared!)

Three major steps to be fulfilled:

- **The first one** is to identify natural threats that those 18 UNESCO World Heritage Sites are prone to
 - Method; GIS use with digital data collected.
- **The second one** is to investigate the level of awareness of experts from National Institutions related with this topic
 - Method; conducting several semi-structured interviews.
- **The third** is to understand risks defined by local agencies, who have responsibility for those sites
 - Method; by online surveys.

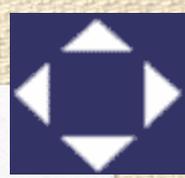


Spatialization of Hazards by using GIS applications



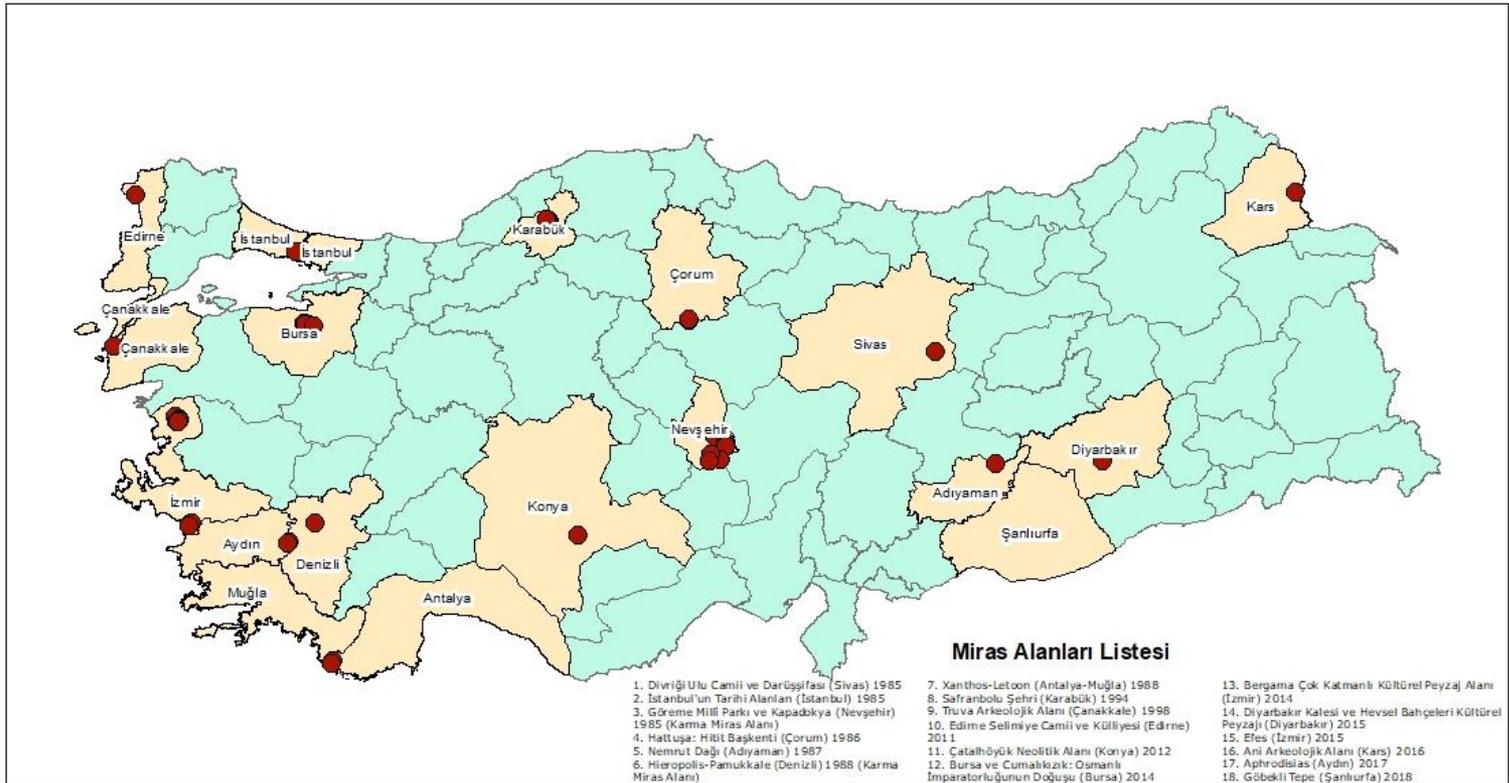
- Past disaster incidences (eqs, landslides, avalanches, rockfalls, floods)
- EQ analysis (proximity to active/passive faults, soil/ground conditions, deterministic analysis based on location/magnitude/frequency of past eqs)
- Landslide Susceptibility Maps (5: the highest to lowest: 1)
- River courses, flood maps (water heights, extensions based on return periods)
- Proximity to closest settlement and current population
- Inventory for surveys and studies of local/central institutions

Expected QUTCOME 1: Base Maps including hazard classification and prioritization of possible losses about 18 WHS across Turkey in order to be an input for developing risk reduction strategies and planning decisions



WORLD HERITAGE SITES IN TR

TÜRKİYE'DEKİ MİRAS ALANLARI



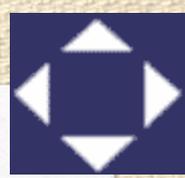
Legend/Gösterim

- Miras Alanları
- İl Sınırları
- Miras Alanları, İller

SCALE: 1:6,449,693

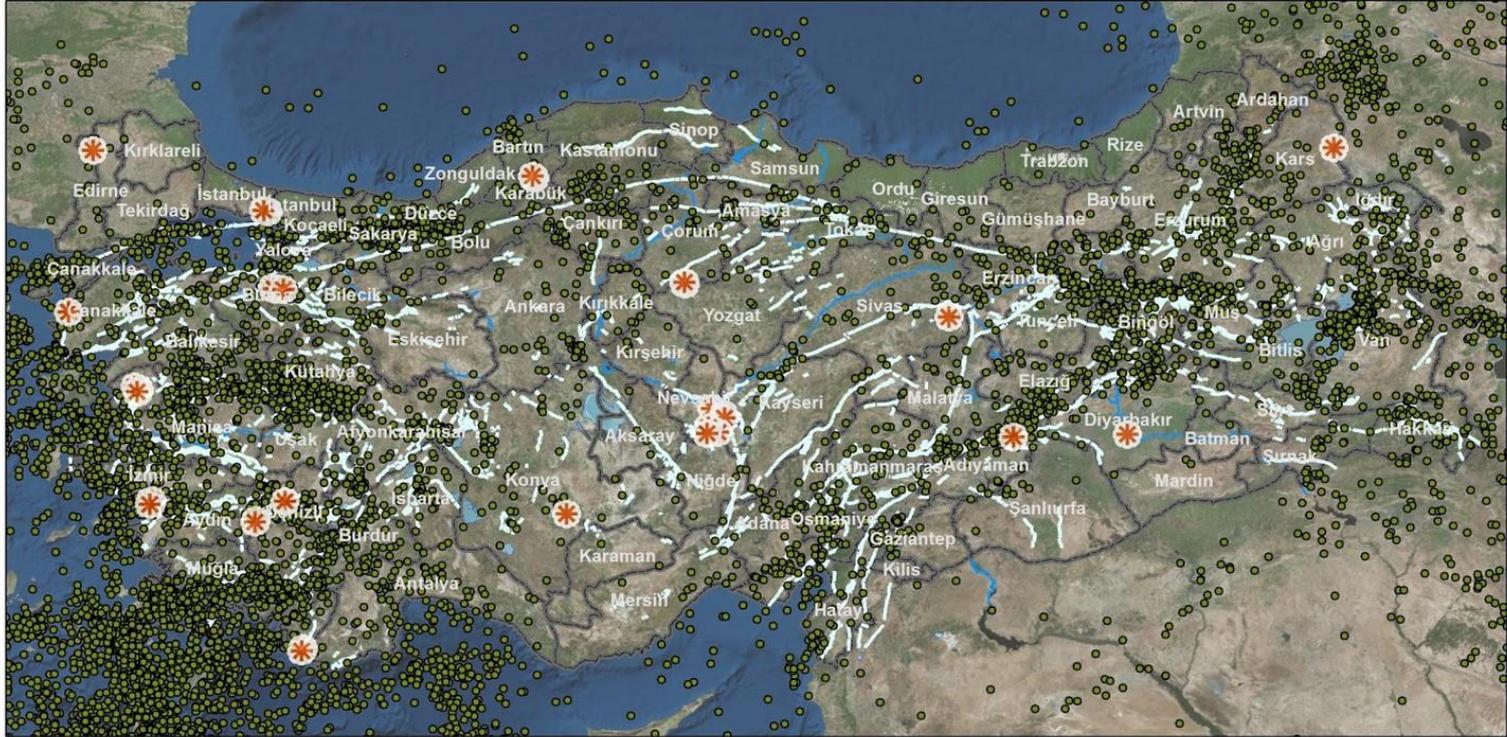
0 70,000 140,000 280,000 420,000 560,000 Meters





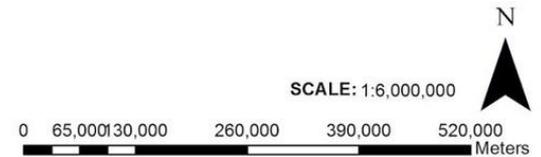
Past Eqs, Fault lines and WHSs in TR

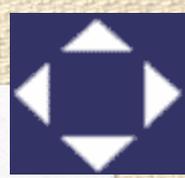
Türkiye Depremleri, Aktif Faylar ve Miras Alanları



Legend/Gösterim

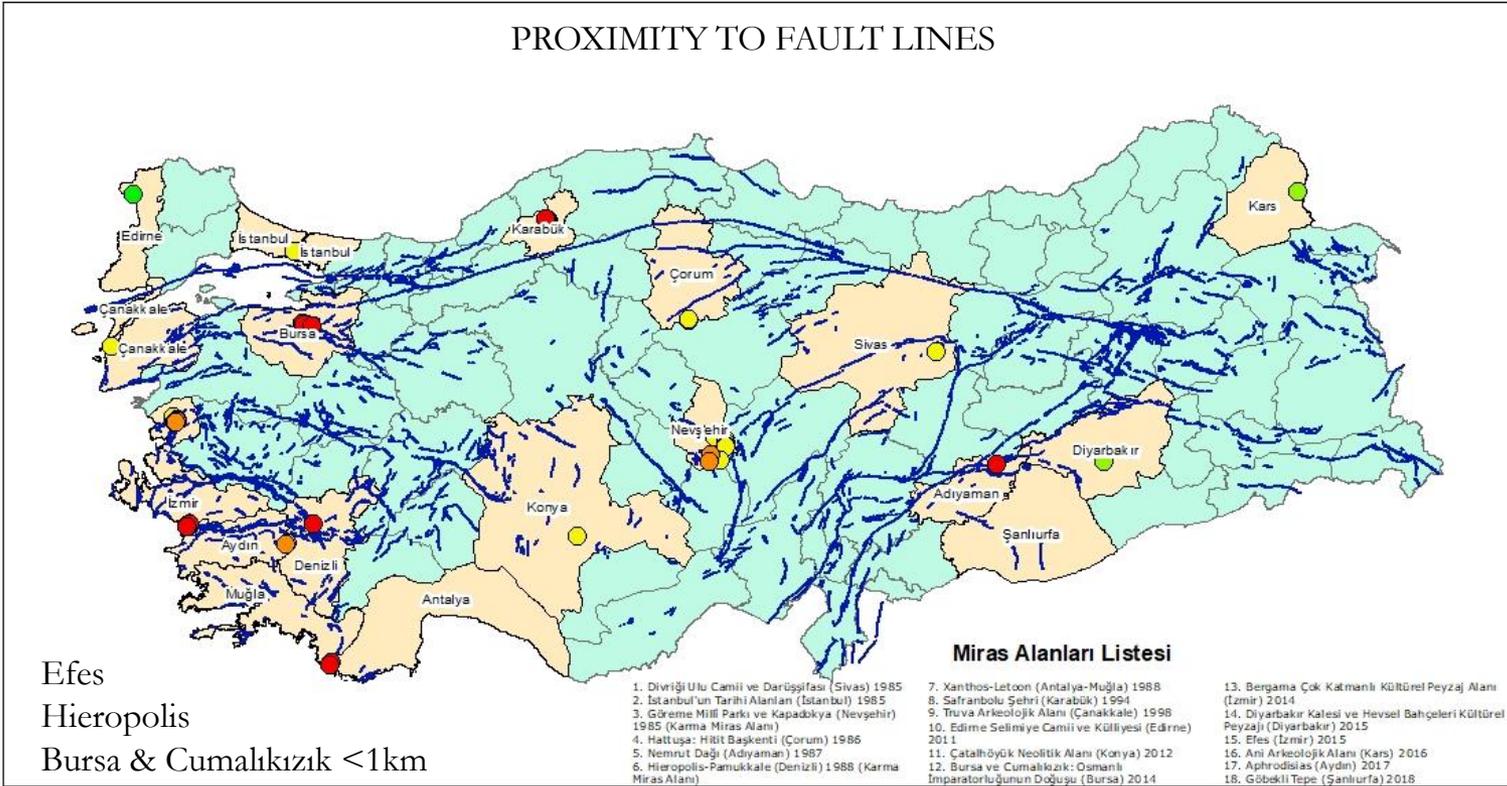
- UNESCO MİRAS ALANLARI
- 1900_2018 Deprem Merkezüsleri
- Diri Faylar
- İl Sınırları
- Göller
- Akarsular





TÜRKİYE'DEKİ MİRAS ALANLARININ FAYLARA UZAKLIĞI

PROXIMITY TO FAULT LINES



Efes
Hieropolis
Bursa & Cumalıkızık <1km

Legend/Gösterim

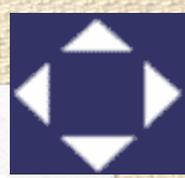
- İ Sınırları — Diri Faylar (2012, MTA) — Miras Alanları, İller
- Miras Alanlarının En Yakın Faya Uzaklıkları**
- 15 m - 2427 m
 - 3104 m - 9041 m
 - 10171 m - 25324 m
 - 38927 m - 59528 m
 - 118867 m

SCALE: 1:6,449,693

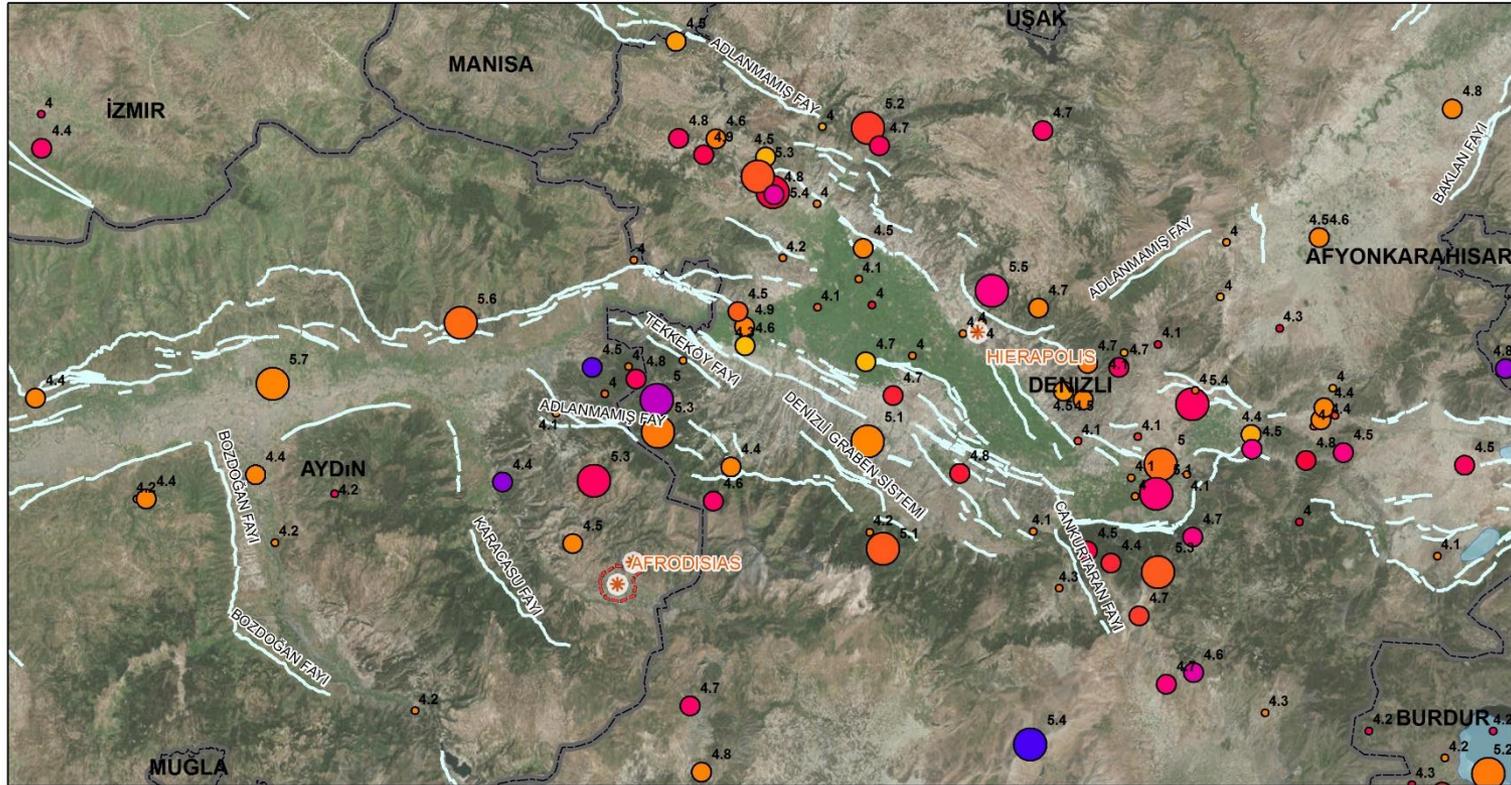
0 70,000 140,000 280,000 420,000 560,000 Meters

N





HIERAPOLIS VE AFRODISIAS



Legend/Gösterim

- UNESCO MIRAS ALANLARI
- UNESCO MIRAS ALAN SINIRLARI
- İl Sınırları
- Diri Faylar
- Göller
- Akarsular

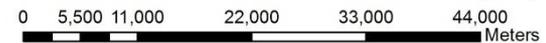
1900_2018 Deprem Merkezleri

- Büyükük/ Magnitude
- 4.0 - 4.3
 - 4.4 - 4.9
 - 5.0 - 7.6

Derinlik (Shallow or Deep)

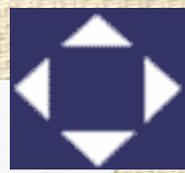


SCALE: 1:500,000

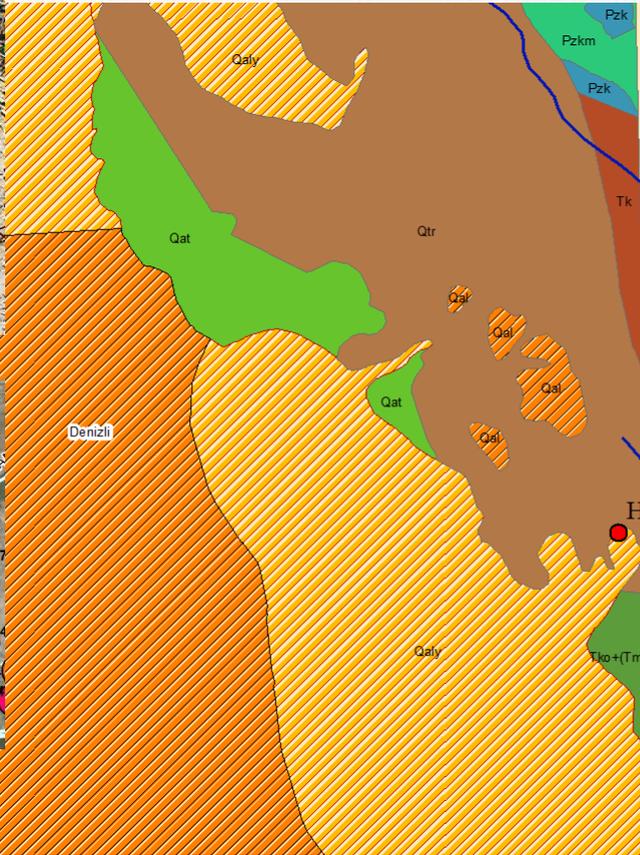
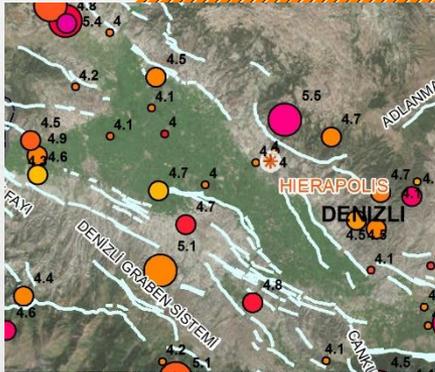


N





Hierapolis, Denizli



Qaly:
Alüvyon
Yelpazesi
üzerinde
bulunmaktadır

Identify

Identify from: <Top-most layer>

Diri Faylar (2012, MTA)
DENİZLİ GRABEN SİSTEMİ

En yakın faya 423 m. uzaktadır.
Aktif olmayan bir faydır

Location: 29.125781 37.927423 Decimal Degrees

Field	Value
OBJECTID	2389
Shape	Polyline ZM
Fay_Tipi	2
Fay_Cesidi	26
Atim_Yonu	
Segment_Ad	Pamukkale Fay Zonu
Uzunluk	948.655758
Deprem_Tar	
Deprem_Buy	
Deprem_Adi	
Segment_No	82-1
Fay_No	82
Fay_Adi	DENİZLİ GRABEN SİSTEMİ
Segment_Va	VAR
Acıklama	Açılma Çatlağı
Uzunluk_M	948.746146
fay_name	DENİZLİ GRABEN SİSTEMİ
Shape_Length	948.839526

Identified 1 feature



Discussion: Settlements vs. Heritage Sites

- Spatialization of current hazards that WHSs expose to and measurement for their impacts on WHSs (change in impact area and volume in time; e.g. climate change effects)
- Vulnerability status (ageing and several other effects may change its overall vulnerability; structural corrosion, additional changes etc.)
- Frequency and probability of hazards (e.g. investment choice)
- Local coping capacity for any hazard (Emergency action plans, risk reduction activities and preparedness, early warning systems and response strategies; e.g. Notre Dame fire)

RISK EVALUATION, RISK AVOIDANCE? RISK REDUCTION STRATEGIES DIFFER!



Project on K.Maraş City as a case for Developing Provincial Risk Reduction Plan with AFAD (Disaster and Emergency Management Presidency) *Ongoing*

Global Framework

İRAP is prepared in line with international developments.

Sendai Framework (2015)

To increase the number of countries with local disaster risk reduction strategies.

Paris Agreement (2015)

Global efforts against climate change and its effects.

New Urban Agenda (2017)

Disaster risk reduction and management, resilience and responsiveness.

Sustainable Development Goals (2030)

Goal 11 Sustainable Cities and Communities
Goal 13 Climate Action

PROVINCIAL DISASTER RISK REDUCTION PLAN

WHAT IS İRAP?

It is a PLAN that specifies targets, strategies and actions aimed at IDENTIFYING and REDUCING risks in provinces.

It is a ROAD MAP that should be produced with all related STAKEHOLDERS and other institutions/organizations in the provinces.

RISK

Identify

Manage

Reduce



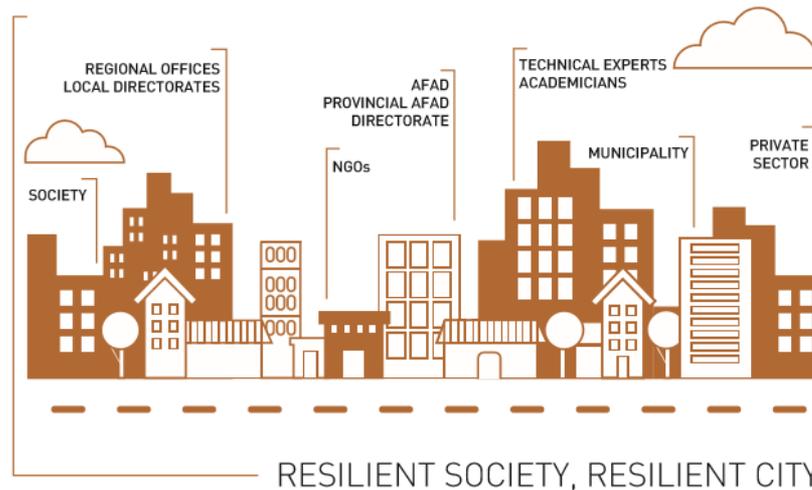
İRAP PROCESS

- 1 Profile of the Province
- 2 Incorporating Risk Assessment Results into the Plan
- 3 Current Situation Analysis by SWOT Method
- 4 Identify the Aim and Goals
- 5 Monitoring and Evaluation

STAKEHOLDERS

Provincial Risk Reduction Plans are prepared in cooperation and participation with regional and provincial directorates of the related institutions and organizations, municipalities and NGOs, in particular provincial AFAD directorates.

It is important that all related institutions and organizations are involved in the process to increase the applicability of the plans.



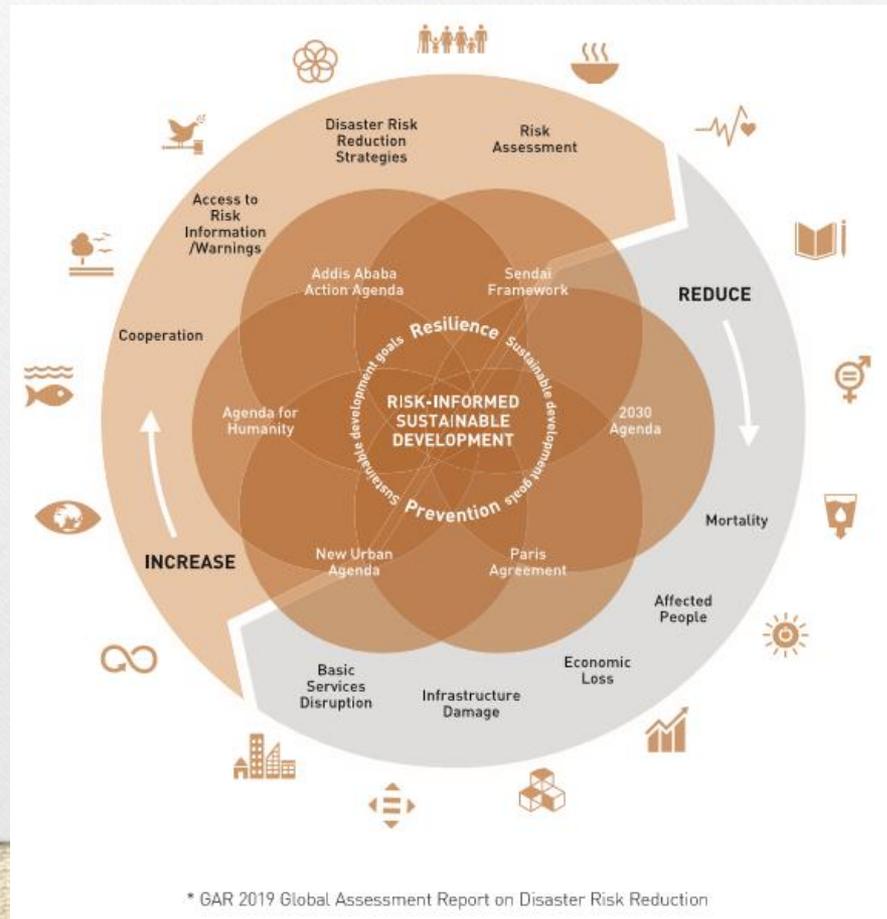


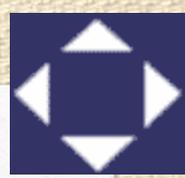
WHY IRAP?

IRAP aims at sustainable development as a guiding principle at the local level.

It is a sustainable plan which; i) outlines the possible impacts of disasters; ii) describes what needs to be done before disasters occur; iii) aims economic, social and environmental resilience; and iv) defines institutions in charge and their responsibilities.

It defines Disaster Risk Reduction strategies and priorities for the creation of Resilient Society and Resilient Cities against the negative impacts of disasters.





Thank you for your attention!

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