Country Presentation: Republic of Armenia

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Location of Armenia and neighboring countries

Armenia is one of the ancient countries in the world. Geographically, it is located in the northeast of Armenian Upland between the Caucasus and Southwestern Asia. It is bordered in the north by Georgia, in the south by Iran, in the east by Azerbaijan, and in the west by Turkey.

General Information

Area: 29.7 km^2

Population: 3.0 million

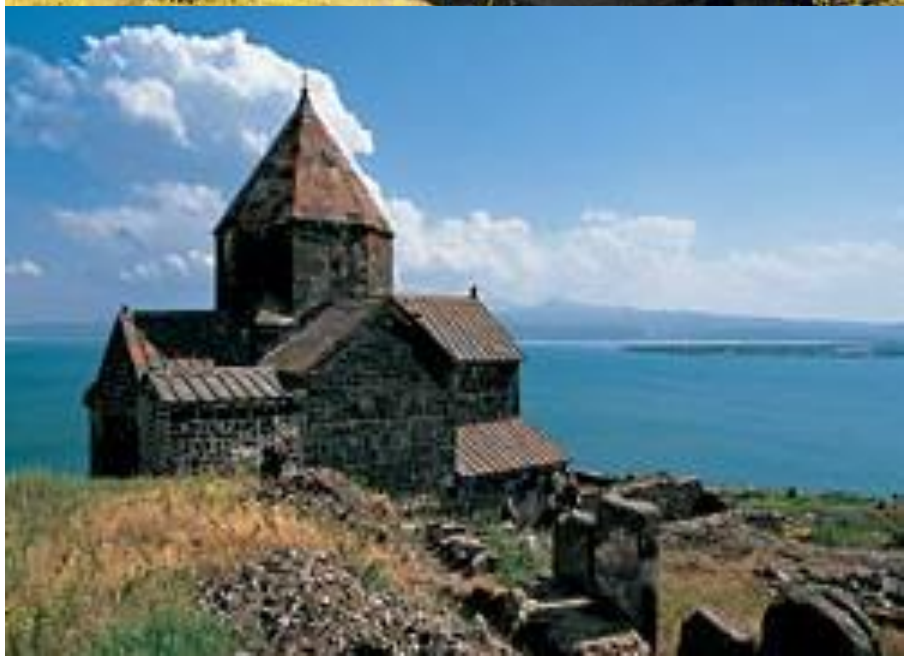
Capital: Yerevan

State form: Republic

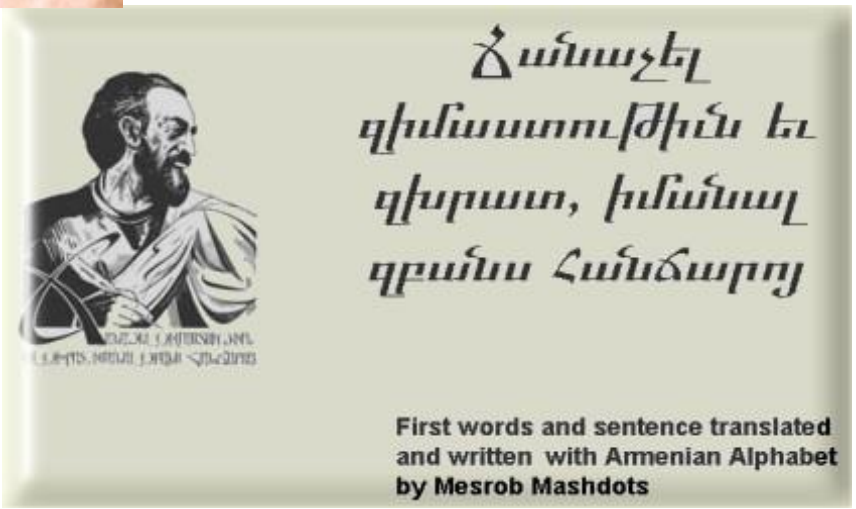
Republic square of Yerevan city

Vernissage

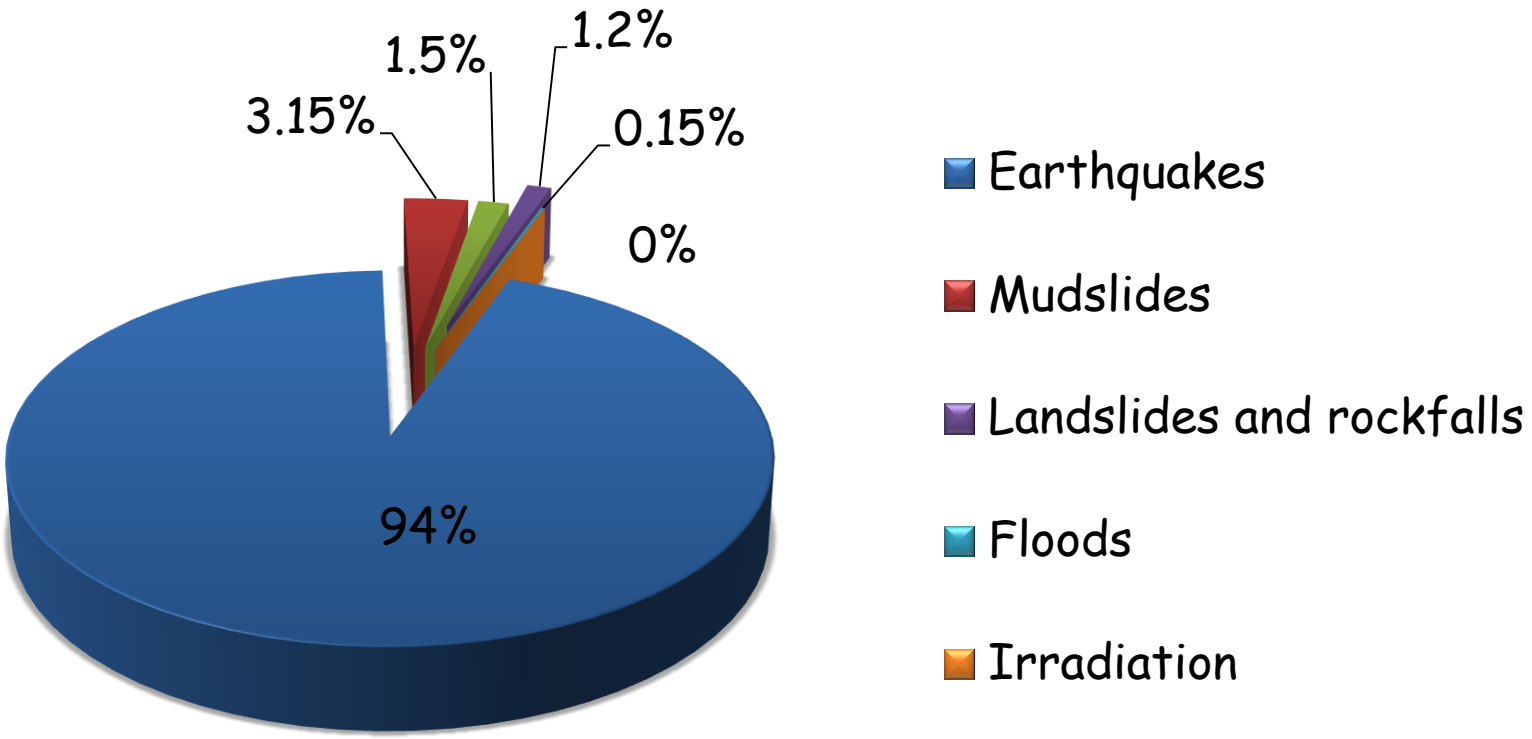
Armenia becomes the first Christian nation



The Armenian Language



The disasters in Armenia



Strong Earthquake in Spitak 1988, M=7.0

- 25.000 people losses
- 250.000 injured
- 500.000 homeless

The main reasons of the losses

- Underestimated seismic hazard
- Structures design and construction errors
- Wrong behavior of the population
- Governmental bodies weren't able to organize the rescue works in time.

Laws and regulations

Seismic Protection activities are regulated by a number of laws and legislative acts and national programs of the Republic of Armenia after Spitak 1988 Earthquake:

Law of RA	The Law of the Republic of Armenia on Seismic Protection (2002)
Resolutions of Government	The Complex Program of Seismic Risk Reduction in Territory of the RA (1999)
	The Complex Program of Seismic Risk Reduction in Yerevan city (1999)
Regulation	Regional Survey for Seismic Protection

Regional Survey for Seismic Protection (RSSP) was founded under the Government of the Republic of Armenia on July 17, 1991.

Now Armenian RSSP is under the Ministry of Emergency Situation.

The basic goal of RSSP is Seismic Risk Reduction in Armenia

Armenian RSSP has developed two Strategic National Programs on "Seismic Risk Reduction in Armenia" and "Seismic Risk Reduction in Yerevan-city". The Programs, adopted by the Government of the Republic of Armenia on the 10th and 7th of July in 1999 are designed for 30 years. All the Ministries and other Governmental, non-Governmental and private organizations will implement these National Programs under the general coordination of Armenian RSSP assigned by the Government as a responsible body for the Seismic Risk Reduction Strategy development and implementation.

Seismic Risk Reduction Strategy includes:

- Seismic Hazard and Risk Assessment
- Vulnerability reduction in urban areas, including reinforcement and upgrading of existing buildings, design of new codes and standards
- Public awareness, people education and training
- Early warning and notification
- Partnership establishment, involving public and private organizations
- Risk management
- Disaster relief and people rehabilitation
- Insurance
- State disaster Law and regulations.

Armenian RSSP Main Tasks

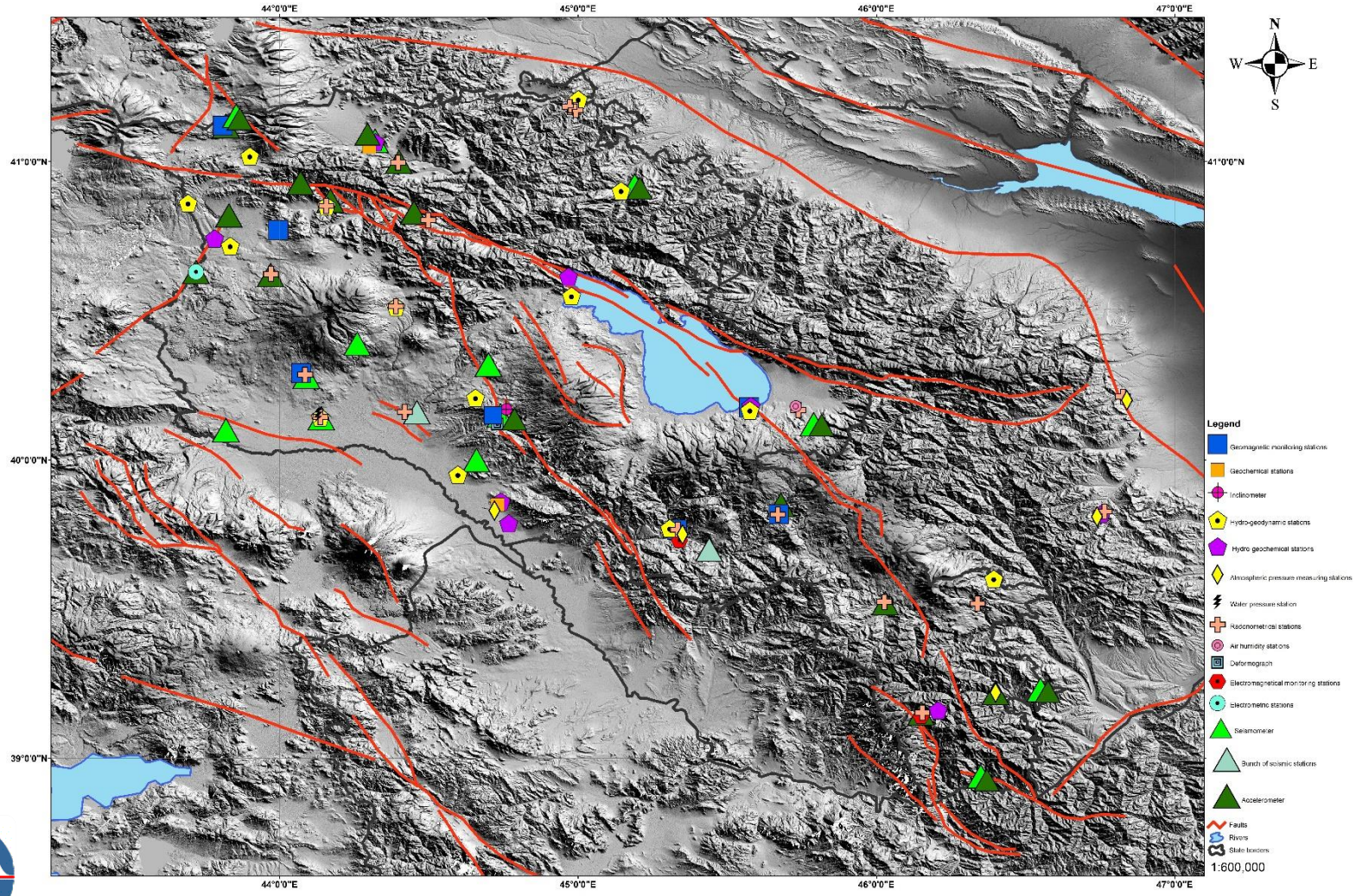
- Seismic Monitoring
- Seismic and Secondary Hazard Assessment
- Current Seismic Hazard Assessment and Earthquake Prediction
- Seismic Risk Evaluation and Reduction, Early Warning

including

- ✓ Earthquake Engineering
- ✓ Population Education and Training
- ✓ Preparedness of Government Officials and Local Authorities
- ✓ Development of Early Warning System
- ✓ Compiling of Hazard and Maps

Seismic Monitoring

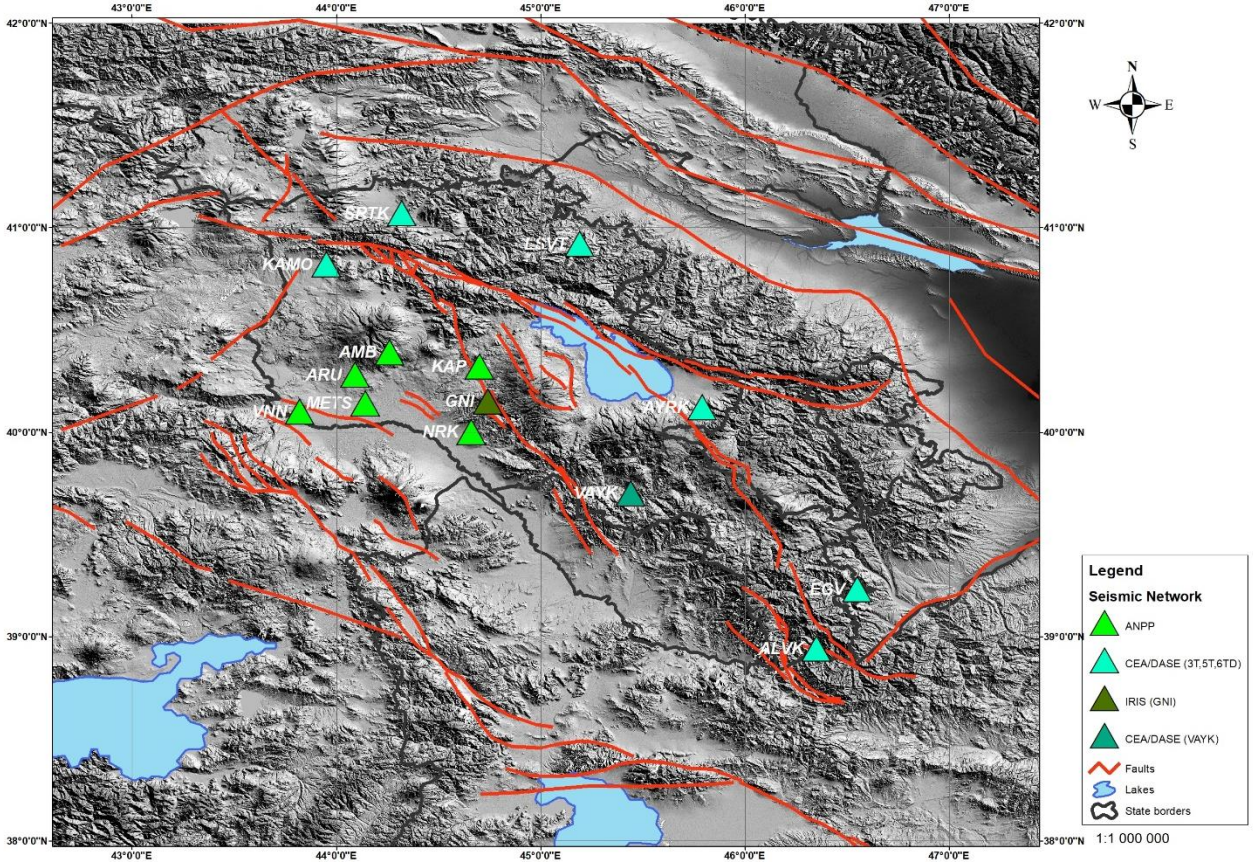
The Armenian RSSP has a unique multi-parameter observation network consisting of 140 stations for real-time monitoring of geosphere.



The RSSP is in charge of the seismic protection and seismic monitoring system. RSSP has the following international and local monitoring systems:

- USGS-IRIS Project
- CTBT International Monitoring System (Comprehensive nuclear Test-Ban Treaty)
- The Real Time Seismic Intensity Display System (Joint Armenian-Japanese (JICA) project)
- READINESS geochemical stations (Armenian-German project)
- Vayk Seismic array network (Armenian-French project)
- Observation Network
- Seismic Network

Armenian Seismic Network



6 High performance, compact, medium-motion broadband **6TD** seismometers

6 High performance, low noise, compact, broadband **3T** seismometers

6 High performance, low noise, compact, broadband **5T** accelerometers

Vayk array **5** short period (Z comp.) and **1** broad-band **STS2**

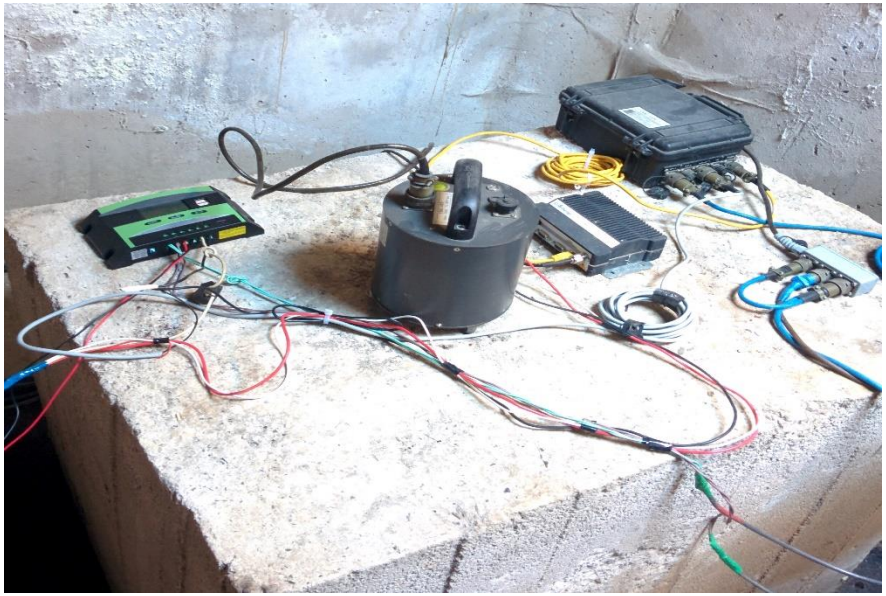
1 Nanometrics Broadband Sensor **Trillium 240**

Global Seismograph Network Station

There is a seismic station in geophysical observatory located in Garni village. This station is included in the IRIS Global Seismographic Network (GSN) and which provides real-time access to its data via satellite.

Guralp Network Stations

I would like to mention that we also have Guralp stations all over our region including seismometers and accelerometers (Guralp CMG - 6TD, 3T, 5T).



GCI, Parabolic antenna,
National Data Center

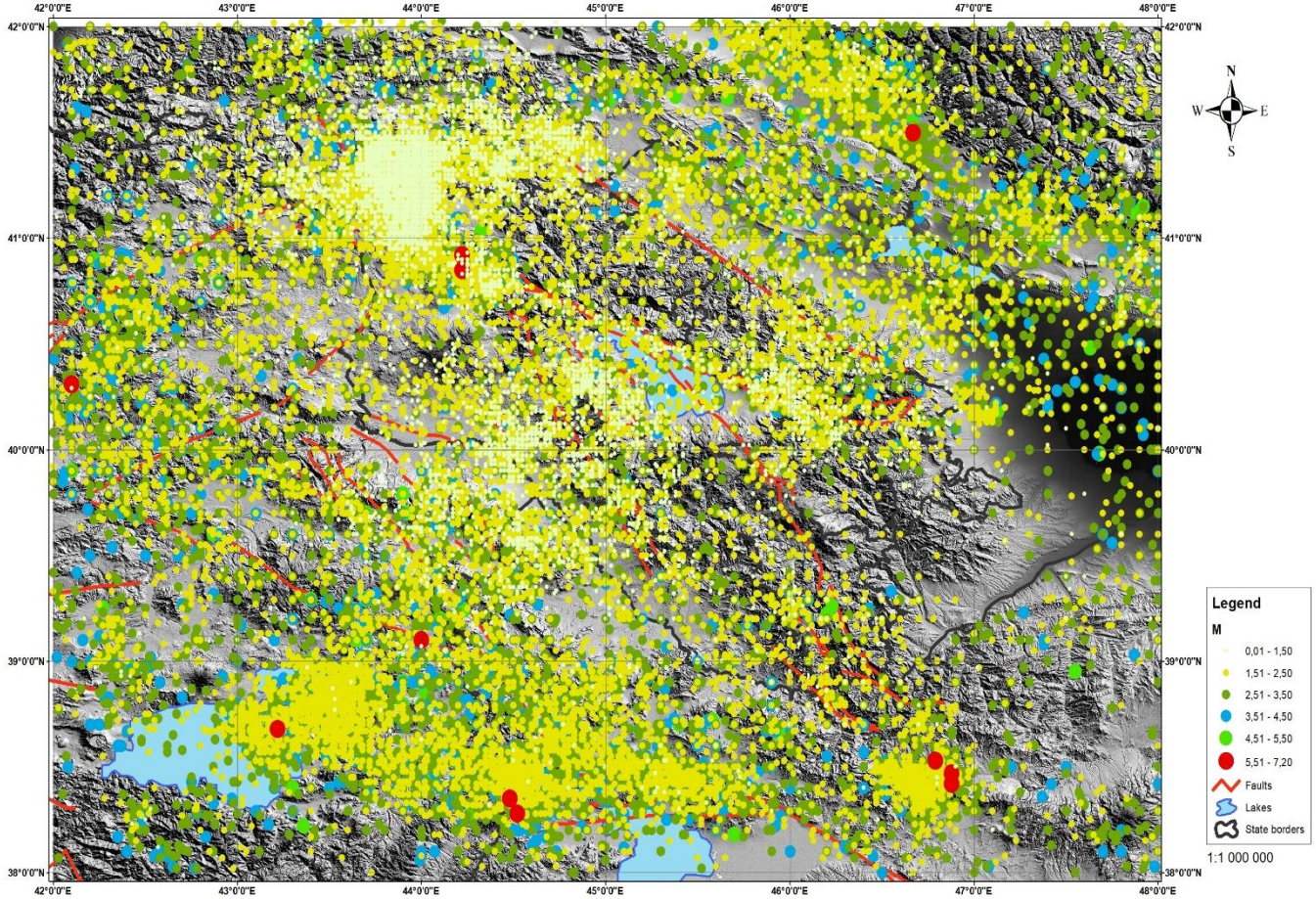
Antenna of GPS station

Hydro geochemical
automatic station

For reliable hazard and risk assessment the following main tasks are applied:

- Creation of a reliable and comprehensive database for the territory larger, than the territory, for which the assessment is carried out.
- Assessment on the basis of modern advanced technologies.
- Seismic Hazard and Risk assessment for the territory of Armenia

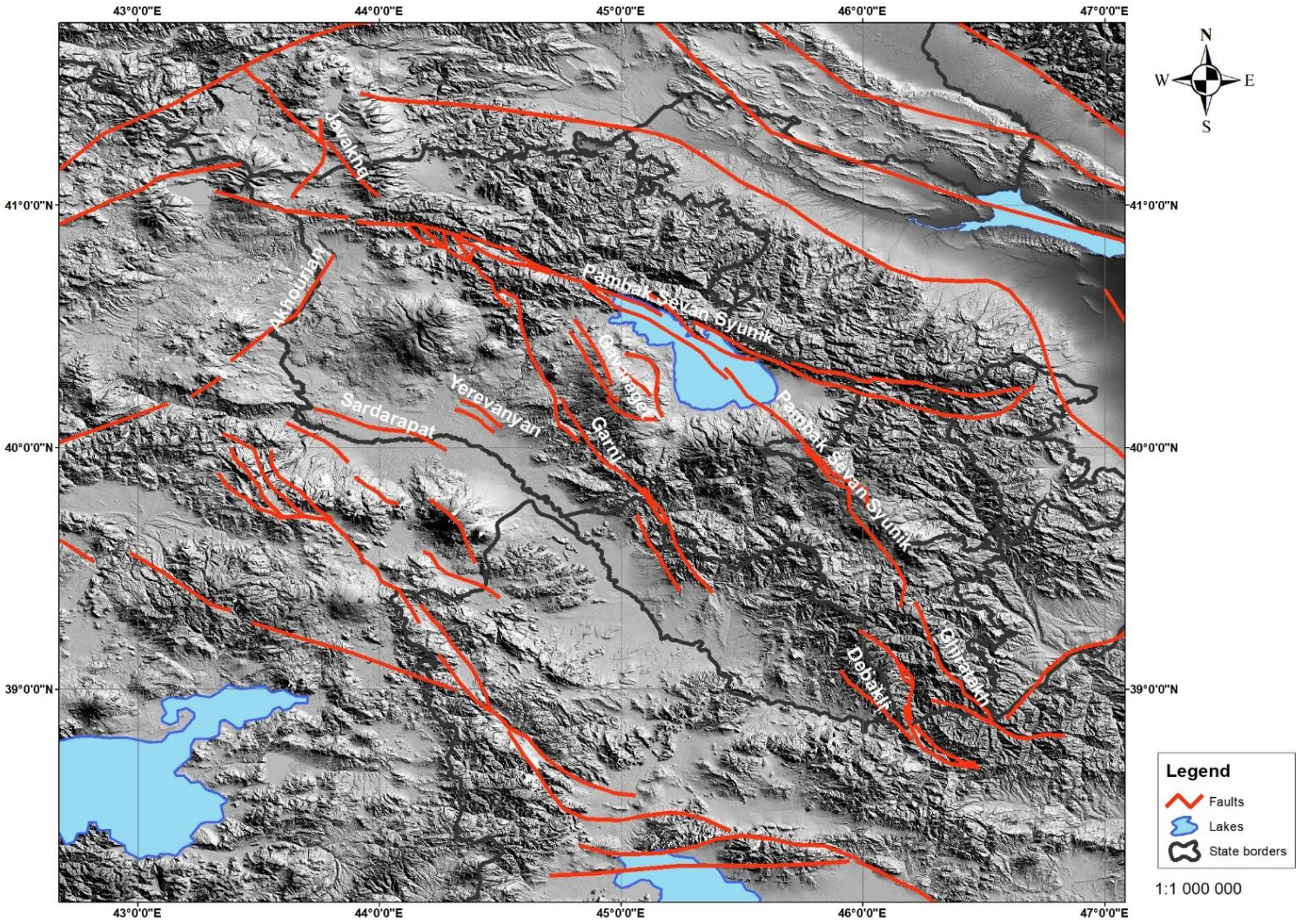
Map of the epicenters of earthquakes ARMENIA AND ADJACENT TERRITORIES



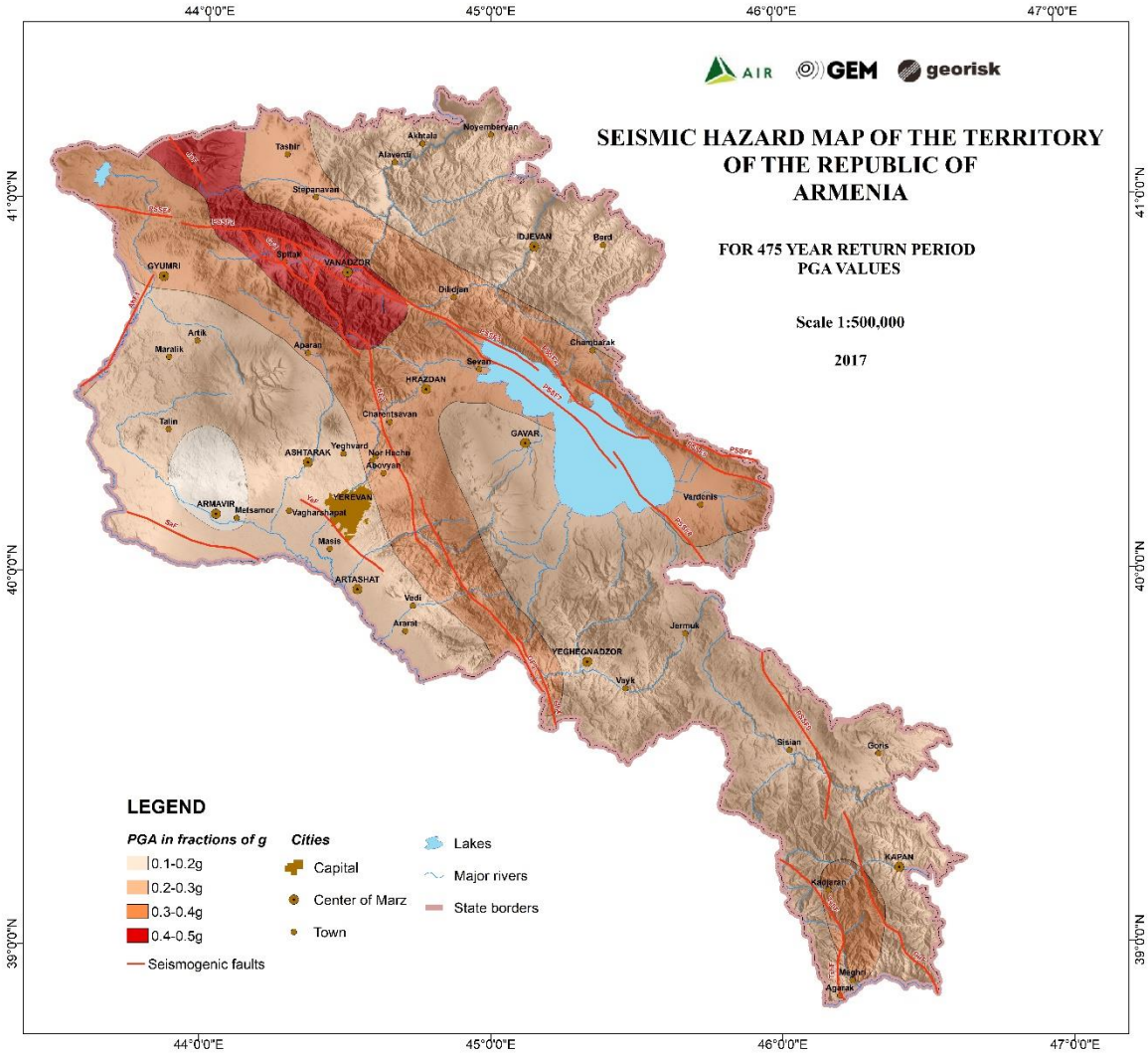
Early (1932-1962) and modern (1962-2022) instrumental period

The catalogue of EQs consists of more than 42.000 earthquakes (including historical and paleoseismological data). Region is characterized with so-called moderate seismicity.

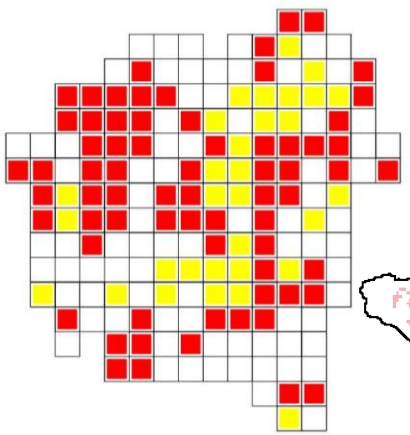
ACTIVE TECTONIC FAULTS OF THE ARMENIA AND ADJACENT TERRITORIES

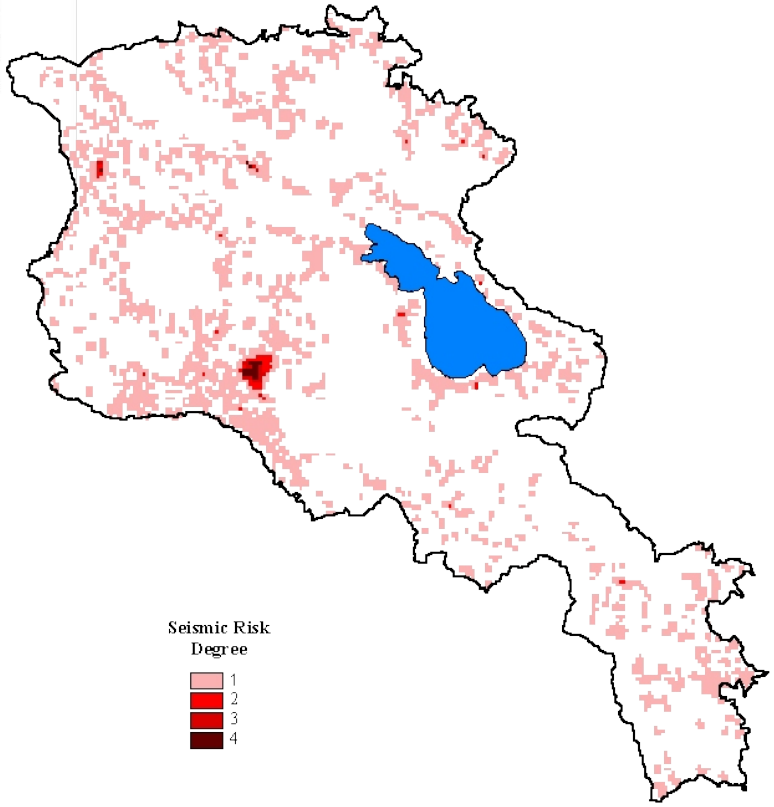


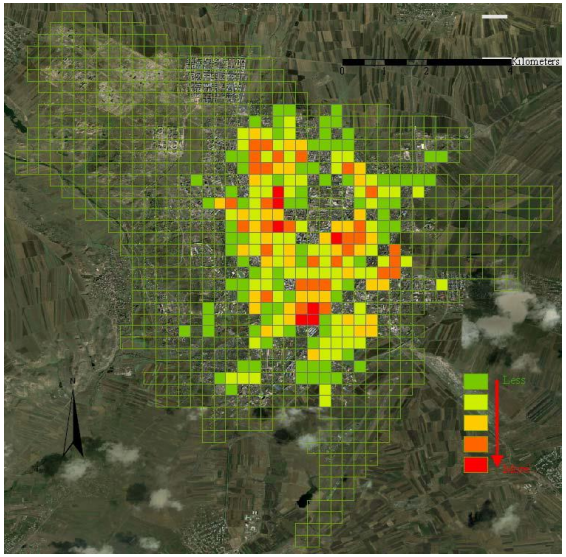
Seismic hazard assessment



Seismic risk assessment







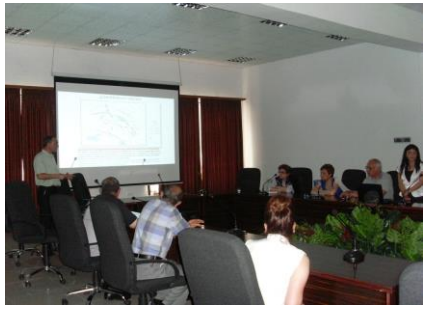
In the Republic of Armenia there has been developed and are being realized the National Programs on raising public awareness in disaster risk reduction area. At present, in all public schools, colleges and higher the corresponding training programs in disaster risk reduction area are realized. The audiences and training programs, respectively are subdivided into two categories:

I. for trainers involved into labor sphere

- top managers
- medium level managers
- specialists
- servicing staff

II. for the non involved ones

- pre-school institution children
- public school pupils
- college students
- students of high education institutions
- housekeepers, pensioners, invalids



The Armenian RSSP has significant achievements in the field of seismic risk reduction.

The main of them are the following:

Seismic Hazard Assessment. The maps of Seismic Hazard Assessment (SHA). The last SHA map was compiled and approved in 2017.

Current Seismic Hazard Assessment. A unique multi-parameter network has been established. It consists of 140 monitoring stations performing round-the-clock data acquisition and analysis via satellites.

Seismic Risk Assessment. The new methods for seismic risk quantitative assessment, based on the main seismic risk assessment factors (such as seismic hazard level, population density and buildings' vulnerability) have been elaborated.

Reinforcement of existing buildings and structures. New methods for increasing the earthquake resistance of existing buildings and structures have been developed, successfully tested and implemented into practice.

New building codes. The Armenian RSSP took part in creation of the first national building codes for Armenia, which are in good accordance with the international standards and requirements.

Public Education. The Center for Public Education and Training has been established in Armenian RSSP. Educational system based on knowledge dissemination through mass media, TV Programs have been developed.

State disaster Law and regulations. Numerous normative documents, regulating organization of seismic protection have been developed. Example: The Law on Seismic Protection has been adopted by the Parliament in 2002.

The main goal of my research will be

SEISMIC MONITORING, SEISMIC HAZARD, RISK ASSESSMENT AND EARTHQUAKE EARLY WARNING SYSTEM IMPLEMENTATION AS A PART OF SEISMIC RISK REDUCTION

Thank you for your attention!