

SEISMIC SENSORS FOR GLOBAL SEISMIC MONITORING AND EARTHQUAKE RESEARCH IN ARMENIA

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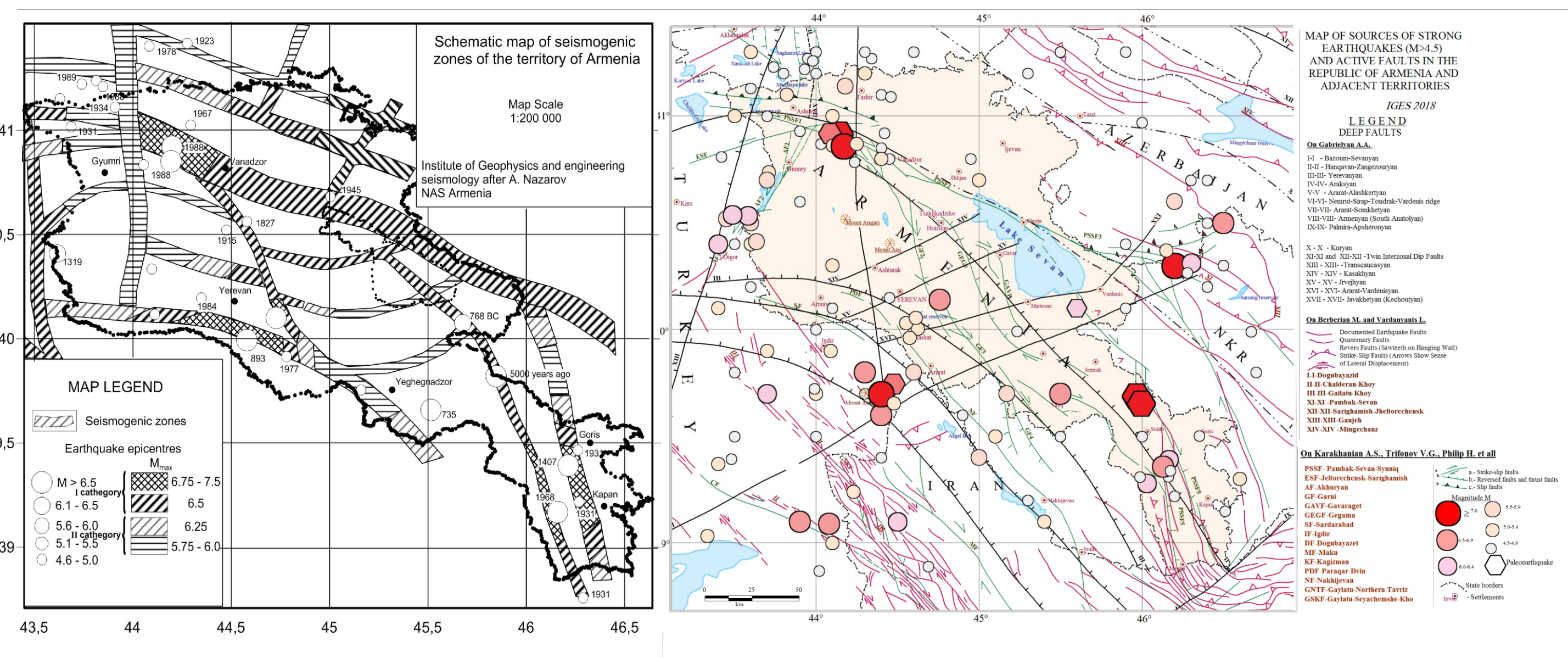
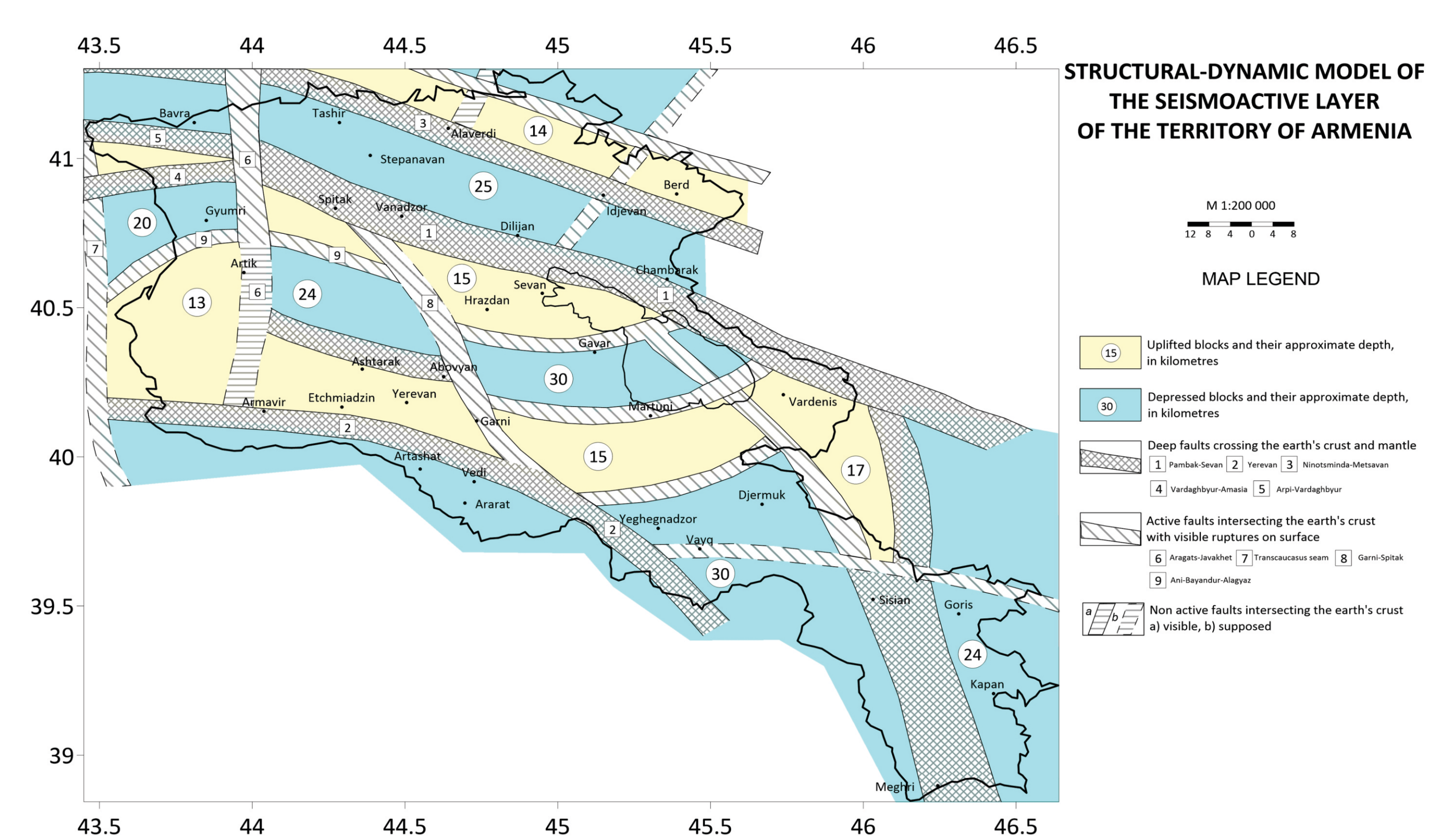
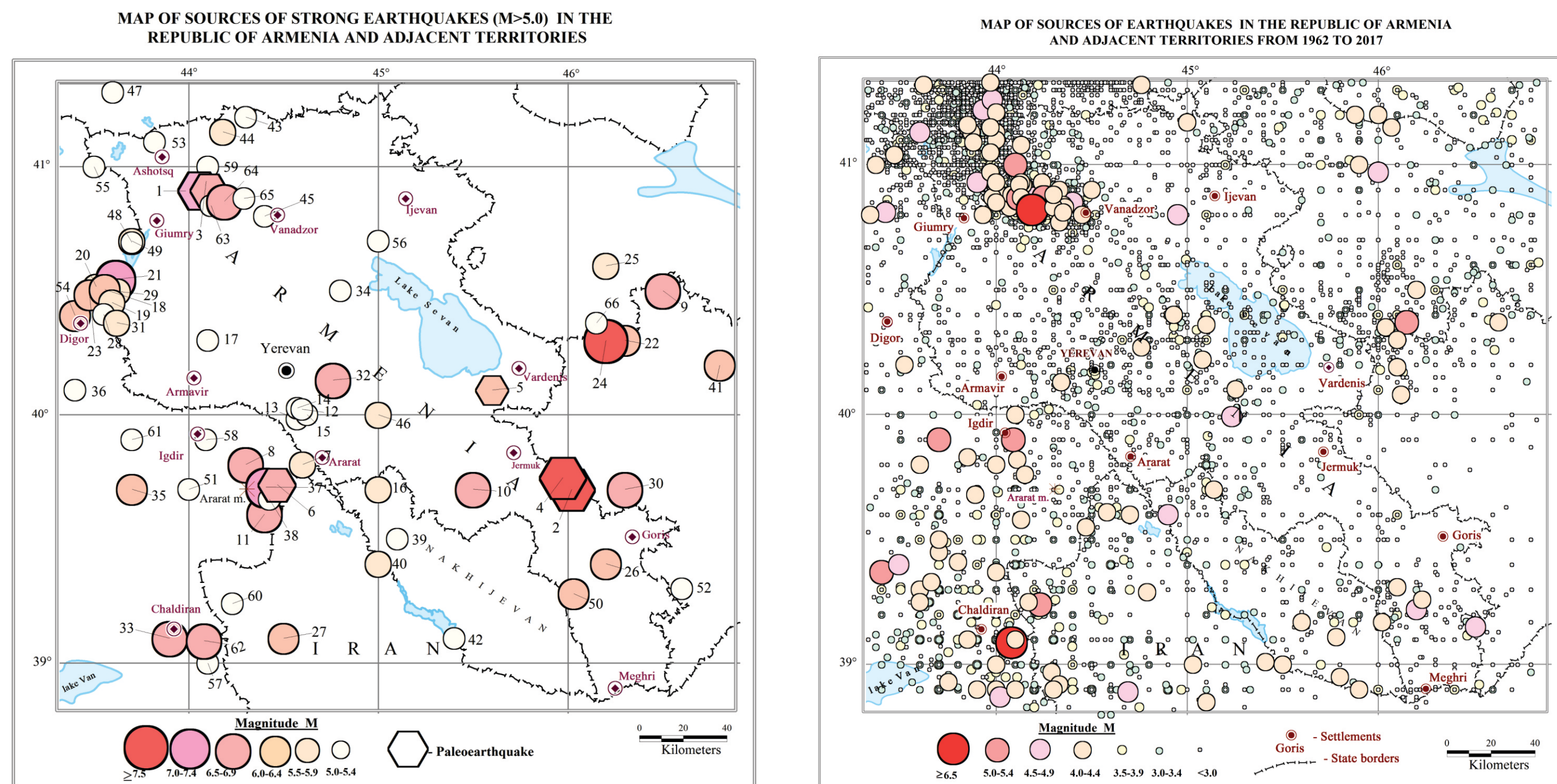
ABSTRACT

In the field geophysical instruments, various seismic sensors (an accelerometer, a velocimeter) and auxiliary equipment in the form of recorders (loggers) have been designed, which provide wireless information transfer to the data collecting and processing center. On the basis of these, instrumental earthquake observation systems have been developed to ensure the integrated security of critical facilities.

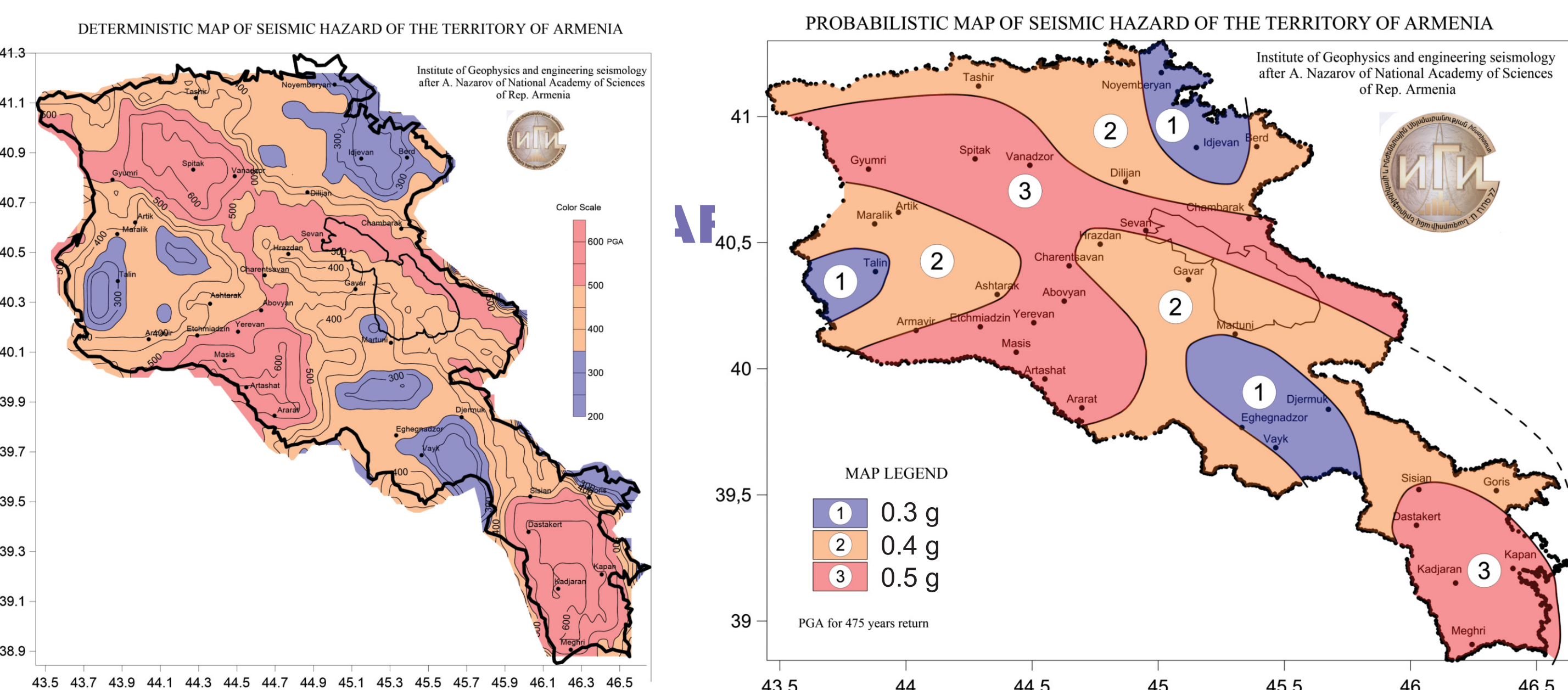
These systems can be transformed to control global seismic monitoring of the territories, dams, also facilities of critical importance such as nuclear power plants, bridges, tunnels and technological pipelines for chemical and oil-processing plants.

The report presents the technical characteristics of the above mentioned instruments and the possibilities of their wide application in different countries. Additionally, monitoring of seismicity of Armenian regions is implemented for the earthquake research.

SEISMOLOGICAL AND TECTONIC CONDITION OF THE TERRITORY OF ARMENIA



DETERMINISTIC AND PROBABILISTIC SEISMIC HAZARD MAPS OF THE TERRITORY OF ARMENIA



MAKING & MANUFACTURING OF GEOPHYSICAL SCIENTIFIC INSTRUMENTS



Geo Date Logger
Technical description
8,16,24 input channel 24 bit
10.....50 hz adjustable filter
2.....10000 adjustable gains
Up to 8 hour walking time time
Interfaces – Wi Fi, Ethernet
4 GB internal memory



Three-Component Pendulum Velocimeter
Technical description
Frequency range 0.1-50 Hz



Portable Shaker Table
Technical description
Frequency - 0.1-100 Hz
Amplitude - 10 mm
Carrying capacity - 5.0 kg
Power supply - 12 V
Current - 1.2 A
Size - 100x200x300mm
Weight 5.0 kg



Three-Component Accelerometer
Technical description
Sensor type - Microelectronic Mechanical Systems (MEMS)



New Type Velocimeter
Technical description
Sensor type - Pendulum Seismometer Velocimeter
Frequency range 0.1-70 Hz
Attenuation - 1.0
Conversion coefficient - 130 V/m/s
Dynamic range 80 dB
Size - 80x100x160 mm
Weight -1.3 kg



Three-Component Accelerometer-Inclinometer
Technical description
Sensor type - Microelectronic Mechanical Systems (MEMS) Accelerometer
Frequency range 0.5-150 Hz
Receptiveness 10V/g
Dynamic range 80dB
Power supply-12V
Inclinometer
Measuring range -100
Resolving ability-0.003%
Size - F60x160 mm
Weight 1 kg



Microtremor
Technical description
Sensor type - Three-component electromagnetic seismometer with feedback
Frequency range 0.1-100 Hz
Receptiveness 130 V/m/s
Dynamic range 80dB
Size - F150x100mm
Weight 1.5 kg



Water Level Meters
Technical description
Sensor type - Downhole water level meter
Measurement depth 30, 50, 100, 150, 200.....1000 m
Measurement accuracy 100x300x300mm
Weight 2.5kg

Water Level Monitoring Smart System

Technical description
Measurement depth up to 1000m
Resolving ability- 0.002 %
Number of data to save - 30
Battery type Li-ion 7.4 V
Charging the batteries - from the solar panels.
Data transfer-Wi-Fi, GSM - With early warning systems
Size - 100x100x100mm
Weight 1kg



Early Warning Wireless Seismic Smart System

Technical description
Sensor type- three-component piezoelectric vibration accelerometer
Frequency range 0.1- 100 Hz; Receptiveness 32V/g; Dynamic range 80 dB;
Resolution 16 bit; Power supply 5V; Current 0.145 mA; Size - 65x131x130mm;
Weight 1.2 kg;
Data transfer - Wi-Fi - With early warning systems
Charging the batteries - from the solar panels.

GLOBAL SEISMIC MONITORING OF THE TERRITORIES AND DAMS TO ENSURE SAFE OPERATIONAL PERIOD



INTERNATIONAL COOPERATION OPPORTUNITIES

- Armenia according to its seismological, tectonic, geological conditions is an open air laboratory. We propose to set and solve divers' problems in the field of geophysics.
- It is proposed to create joint seismic, Earth magnetic and electric field stations aimed at global monitoring.
- To establish collaborative laboratories in the field of Earth Sciences.

NATIONAL ACADEMY OF SCIENCES OF THE REPUBLIC OF ARMENIA INSTITUTE OF GEOPHYSICS AND ENGINEERING SEISMOLOGY AFTER A. NAZAROV

- Excellence in Research
- Geophysics
- Engineering Geophysics
- Environmental Geophysics
- Earth's Magnetic Field
- Seismology
- Predicting Earthquakes

- Engineering Seismology
- Strong Ground Motion Database
- Analysis & Modeling
- Seismic Hazard & Risk Assessment
- Earthquake Engineering & Structural Dynamics
- Making & Manufacturing of Geophysical Instruments

Year founded:1961

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