Asia-Pacific
Economic Cooperation

2018/SOM3/EPWG/018
Agenda Item: 9

Earthquakes and Waterfloods Monitoring System with the Application of the Internet of Things

Purpose: Information
Submitted by: Russia

APEC 2018
PAPUA NEW
GUINEA

14th Emergency Preparedness Working Group Meeting
Port Moresby, Papua New Guinea
10–11 August 2018

«Earthquakes and Waterfloods Monitoring System with the application of the Internet of Things (IoT)»

APEC TEL58 (Chinese Taipei)

October 1

2018

Relevance

To increase the predictive potential of existing global and national monitoring systems for earthquakes and waterfloods using the advancement of ICTs

The workshop will be held on the sidelines of the TEL58 meeting in Chinese Taipei, Taipei city

Date: October 1, 2018 (14:00-17:00).

Venue: Taipei International Convention Center 2F Meeting Room 201DE

Organizer: The Russian Federation

Contacts: Ms. Natalia Kulieva (n.kulieva@minsvyaz.ru copy to apectel2018_workshop_iot@mail.ru)

Track One: Increasing the potential of existing earthquakes, waterfloods and other natural and man-made disaster monitoring systems

Track Two: Existing indicators: global space-time and navigational systems (GPS, GLONASS etc.), global and domestic weather monitoring systems etc.

Track Three: Possible solutions. IoT indicators, mathematical processing of monitoring data, ICT-based remote monitoring hardware

Track Four: Way forward. APEC economies cooperation to further increase the potential of disaster monitoring systems

APEC Workshop on Earthquakes and Waterfloods Monitoring System with the Application of the Internet of Things (IoT)

Topic	Speaker
Track One: Increasing the potential of existing earthquakes, waterfloods and other natural and man-made disaster monitoring systems.	
Increasing the potential of existing earthquakes & waterfloods monitoring systems	Dr. Viliam Sarian, Radio Research and Development Institute
Tsunami hazard assessment in the Pacific Ocean tsunamigentic regions	Dr. RBS Yadav Department of Geophysics,Kurukshetra University
TBD	Larisa Jovanovic ALFA University, Belgrad, Ecological Society of Serbia
Track Two: Existing indicators: global space-time and navigational systems (GPS, GLONASS etc.), global and domestic weather monitoring systems etc.	
Predicting earthquakes in the regions with seismic activity: synchronous processing of monitoring data methods	Dr. A. Lyubushin, Schmidt Institute of Physics of the Earth of the Russian Academy of Sciences (IPE RAS)
Free slot	
Field trials of innovative detectors sensitive to signals in ionosphere preceding earthquakes (tentative)	Mr. Y. Zaryanov, NIIR Svyaz LLC
Track Three: Possible solutions. IoT indicators, mathematical processing of monitoring data, ICT-based remote monitoring hardware	
Organizing field ecological, bio and geo-chemical experiments	Dr. V. Yermakov, V.I. Vernadsky Institute of Geochemistry and Analytical Chemistry
Free slot	
Free slot	
Free slot	
Track Four: Way forward. APEC economies cooperation to further increase the potential of disaster monitoring systems.	
TBD	Dr. Viliam Sarian, Radio Research and Development Institute
Free slot	
Panel discussion and Q&A session	

Speakers

Prof. Dr. Viliam Sarian

Honored Worker of Communications of Russia, Science Consultant in Federal State Unitary Enterprise Radio Research and Development Institute (FSUE NIIR). Viliam Sarian is State Prize of Russia winner, has 2 prizes of the Russian Government in science and technology. Prof. Dr. V. Sarian was elected a foreign academician of the National Academy of Sciences of Armenia.

Area of scientific interest of Prof. Dr. Sarian includes the theory of information networks management, the theory of ICT services, development of the model of limitations of the development of ICT, development of customized management in emergency situations, etc.

Speakers

Prof. Dr. Vadim Ermakov

Head of the Laboratory of environment at Biogeochemistry Vernadsky Institute Of Geochemistry and Analytical Chemistry of Russian Academy of Sciences. Main research interests – geochemical ecology, biogeochemistry. The most known work on the biogeochemistry of Se, F, Hg, As, Mo, W, Re and toxic xenobiotics; the methodical cycle of works on development of system of criteria for the assessment of ecological status of the territories and of the biogeochemical indication.

Prof. Dr. Vadim Ermakov is foreign member of the Academy of innovation Sciences by Nikola Tesla (Belgrade, 2008), corresponding member of the Academy of Catalonia (Spain, 2011)

Speakers

Prof. Dr. Alexey Lyubushin

Institute of Physics of the Earth, Russian Ac.Sci., head of laboratory. Research interests include: multidimensional signal processing, wavelet analysis, point process statistics, geophysical monitoring, earthquake prediction, seismic hazard assessment, stochastic climate models, monitoring time series big data analysis.

The main scientific achievement of A.A. Lyubushin for the period is the development and realization of a new method of an estimation of seismic danger based on construction in a moving time window of maps of multi-fractal properties of low-frequency seismic noise by the data from broadband seismic stations networks covering seismically active region. These methods after applying to the data from network F-net in Japan have allocated correctly the region of mega-earthquake of March 11, 2011. The forecast of catastrophe, at first with an estimation of magnitude only (middle of 2008), and then with a lower estimate of time (middle of 2010) was beforehand published in a series of articles and theses at the Russian and international conferences (general number - 10).

Speakers

Mr. Yury Zarianov

NIIR-Svyaz Ltd., CEO.
In 2006-2009 he developed and commissioned TV and communication receivers and transmitters at Five Russian Polar Stations in the Arctic.

Currently, NIIR-Svyaz Ltd. is a developer of receivers and transmitters meteorological stations for HydroMetCenter of Russia as well as developer of earthquakes and tsunami precursors finding systems in ionosphere.

Results

Sarian V., Nazarenko A., Lyubushin A., «Creating a hybrid monitoring , network of global processes of natural and men-made disaster of planet Earth using geotehologes of the IoT. GeO IoTWorld, Brussels. Belgium, 25 may 2016

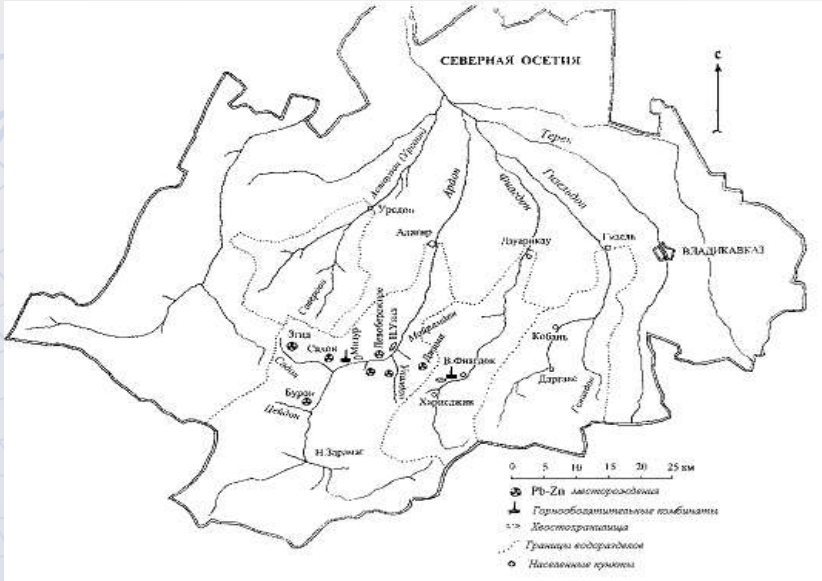
Filatov D., Lyubushin A. (2017) Quantification of Seismic Hazards with Detrended Fluctuation Analysis of Time Series: Case Studies of the Japanese Islands and California. Joint Scientific Assembly of the International Association of Geodesy (IAG) and International Association of Seismology and Physics of the Earth's Interior (IASPEI), Kobe, Japan, July 30 - August 04, 2017.

Results

Ermakov V. V., Tyutikov S. F., Safonov V. A. Biogeochemical indication of microelementhoses. M.: Science, 2018. 487 p

Implementation

Experimental site on the territory of the geological base of the Lomonosov Moscow State University in North Caucasus, Russia



Information on this work will be presented at the seminar

Multi-fora engagements

We are in talks with following institutions to engage them in the workshop:
National Science and Technology Center for Natural Disaster Reduction (Taipei)
the Swiss Higher Technical School in Zurich (Switzerland)
the Institute for Environmental Analysis Methodology (Italy)
the Institute of Geodynamics The Athens National Observatory (Greece)
the University of Hokkaido (Japan)
the University of Southern California (USA) and others.

We also hope that the APEC economies, particularly from the EPWG and the TELWG can participate in the workshop.

Objectives

- To invite EPWG to participate in the workshop
- To provide analysis of the best practices for emergencies prediction with the use sensors based on ICT
- To develop recommendations on the proposals to the TELMIN, as well to the 2018 APEC Leaders and Ministerial Statements
- [Proposal] To create and use 2 experimental polygons on the territories of APEC economies based on IoT with a significantly increased predictive potential, where scientists from different economies could experiment

Contacts

- We encourage all the APEC economies to attend the workshop

- We also encourage experts to serve as speakers and share the results of your work during the workshop in the course of the tracks.

- For APEC-funded travel-eligible economies: Please send your request for participation through your TELWG representative.

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Scientific advisor: Dr. Viliam Sarian (sarian@niir.ru)

Thank you!