



## FINAL REPORT



### 5<sup>th</sup> SALGEE Workshop

"MSG Land Surface Applications: Heat waves, Drought Hazard and Fire Monitoring"

Yerevan, 18–20 September 2017, Armenia

*SALGEE Secretary*  
*October 2017*

#### 1) Introduction

The 5<sup>th</sup> SALGEE2017 Workshop "MSG Land Surface Applications: Heat waves, Drought Hazard and Fire Monitoring" was held at Yerevan /Ani Plaza Hotel/, Armenia, on 18-20 September 2017 and was hosted by the Service on Hydrometeorology and Active Influence on Atmospheric Phenomena of Armenia. Armenian Hydromet Service belongs to Ministry of emergency situations of the Republic of Armenia.

The Workshop is supported by EUMETSAT in the frame of SALGEE (Satellite Applications for Land surface analyses Group for Eastern Europe) project. It is an advanced thematic Workshop, providing a forum and framework to develop strategic objectives and collaborations to maximize the uses of EUMETSAT LSA SAF products for the long term.

#### 2) 5th SALGEE Workshop objectives

The 5<sup>th</sup> SALGEE2017 Workshop is organized in line with the LSA SAF CDOP-3 phase strategic goals to reflect contemporary needs and capabilities of satellite technology using multiple sensors for monitoring and forecasting land surface state and environmental processes, their anomalies and related high impact weather and climate events. Some aspects of environmental response to weather and climate that provoke drought-related phenomena put in consideration during the 4<sup>th</sup> SALGEE2017 Workshop for the first time now are further explored.

The specific goals were:

- Based on using multidisciplinary approach to illustrate the utility of satellite products for characterizing biogeophysical aspects of natural hazards of drought, fire risk, forest/wild fires and their environmental effects. To report development of concepts, to explore validation approaches, communicate the broadening range of LSA SAF applications for southeastern/eastern Europe and case study examples.

- To provide a forum to review the key uses of satellite data in this field and share experience among the NMSs user community (mainly) and product developers/trainers from EUMETSAT, LSA SAF, NASA, NOAA, and others.
- To consolidate current User Requirements. The intention is for users to be able to identify requirements for new data sets, to develop collaborations with the data providers and to respond to training needs of the new comers in the SALGEE initiative.

### 3) Administrative organization of the 5th SALGEE

The Armenian Hydromet Service in cooperation with EUMETSAT organized the logistic aspects of the 5th SALGEE Workshop, as:

- Invitation Letters, signed by the by the Armenian Hydromet Director were sent to all sponsored participants.
- The Workshop was held at the Hotel "*Ani Plaza Hotel*" in the town Yerevan, Armenia. The opening was at 09:00 hr on Monday, 18 September 2017. An official opening ceremony was organised with the attendance of Mr. Davit Karapetyan, Deputy minister of the Ministry of emergency situations and TV representatives. The closure was at 12:30 h on Wednesday, 20 September.
- Logistics: Responsible person for the Local Organising Committee in Armenia regarding the organization of all logistic matters was Ms. Zarmandukht Petrosyan, Head of Meteorological Centre in Hydromet Service. All participants were staying at "*Ani Plaza Hotel*". The lecture Hall was in the hotel with good facilities for presentations. Most of the participants arrived on 16 Sep late afternoon or 17 Sep in the nighttime; only one person arrived on 18 Sep on the day of his presentations. The transportation from/to airport –hotel was by taxi, by grouping the participants. Training equipment: All SALGEE presentations were given as oral talks using hotel technical equipment for PowerPoint presentations. Very good Internet connection was available in the Hotel.
- Social events: Three social events were organised for the 5<sup>th</sup> SALGEE participants:
  - The Armenian Hydromet Serevice hosted a Dinner in the Hotel on 18 September 2017.
  - Workshop dinner on 19 September 2017 hosted by EUMETSAT was organised.
  - A tour and visit to the two remarkable ancient places was organised after the closure of the workshop, in the afternoon of 20 September. We visited the following places: The medieval monastery Geghard in the Kotayk province of Armenia; Temple of Garni in village of Garni in Armenia's Kotayak Province, the best-known structure and symbol of pre-Christian Armenia.
- Finances: The workshop was sponsored by EUMETSAT and co-sponsored for one dinner and the tour on 20 September by the Armenian Hydromet Serevice.
- For administrative matters the responsible person from EUMETSAT was Ms. Regina Hoefenmayer.

A high level organization of the workshop including: logistics, facilities for presentations, coffee breaks, social events, and transportation.

Zarmandukht Petrosyan, Local co-organiser  
Head of Meteorological Centre Armenian Hydromet Service



#### 4) Scientific program of the 5<sup>th</sup> SALGEE

- The scientific program of the workshop was developed in the frame of WP 4 of the implementation of the SALGEE Project 2016-2017 in accordance to EUMETSAT P.O.Number/Date 4500014394/18-October-2016.
- Lecturers are selected and invited by Julia Stoyanova
- The SALGEE secretary (Dr. Julia Stoyanova, NIMH Bulgaria) was the chairperson of the 5<sup>th</sup> SALGEE Workshop.

The work on the EUMETSAT P.O. 2016 was framed in 4 Work Packages, aimed to contribute the development of the workshop agenda, and to illustrate by case study examples practical use of multimission satellite systems in terrestrial drought assessments and its environmental response, including:

**Work Package 1:** Construction of satellite data sets from EUMETSAT geostationary and NASA/NOAA polar orbiting satellite missions for land applications

**Work Package 2:** Combined use of geostationary and polar orbiting missions of EUMETSAT and NASA/NOAA for detection/ monitoring of thermal anomalies on land surface

**Work Package 3:** Terrestrial state analyses and forecasts. Heat waves and drought effects/fire risk.

**Work Package 4:** Elaboration of the draft programme for the 5th SALGEE Workshop & further development of the SALGEE web page

Some of the potential lecturers were prevented to attend the workshop but other presenters covered their talks (see the agenda, **Appendix 1**), i.e.:

Martin Wooster was replaced by his colleague Weidong Xu from King's College, UK  
Florian Pinault replaced Dominique Career, Meteo France.

#### 5) 5th SALGEE Workshop structure

The agenda of the 5<sup>th</sup> SALGEE Workshop covers a broad scale of MSG applications related to different aspects of the complex heat waves-drought problem and corresponding environmental response provoked by weather and climate extremes. In general we followed the scope of the preceding SALGEE WS, covering the problem of drought and vegetation fire but broadening the aspects of their study by using information from different satellite platforms. The agenda (see **Appendix 1**) included seven general sessions based to the following respective topics:

**Topic1:** EUMETSAT activities in Land Surface Analyses (*covering overview lectures of the activities in LSA SAF, SALGEE in the scope of the forthcoming CDOP-3, including also Armenia experience in land surface analyses.*

Deputy Minister of Emergency Situations of the Republic of Armenia opened the Workshop. The Director of the Hydromet service Mr. Levon Vardanyan attended this introduction session and gave opening talk too. SALGEE Secretary (Dr. Julia Stoyanova) and LSA SAF representative (Luis Pessanha) accent on the work of SALGEE in the domain of CDOP-3 phase.

**Topic 2:** Observation of land surface from space

*An overview of LSA SAF products in current use and forthcoming during the CDOP-3 is presented. Accent is given on LST product and possibilities to be derived by infrared and microwave sensors.*

**Topic 3:** Fire detection and monitoring – multimission

*Accent is given on geostationary EUMETSAT and LSA SAF fire products as well as on the new polar orbiting (NASA-NOAA), S-VIIRS available for SEE. Comparison between all satellite detections of fire cases was presented. Decoding Software for NOAA VIIRS Active Fire developed by Turkish Met Service was presented.*

**Topic 4: Land surface state and Atmosphere Dynamics**

*This topic linking land surface state and atmosphere dynamic both detected by satellites is a new topic in the SALGEE work. Two lectures were presented. .*

**Topic 5: Using satellite information for diagnoses and forecast of fire risk**

*Three lectures on this topic were given. A new operational system of fire danger rating over Mediterranean Europe was presented by Portugal. A new Composite index of fire danger was presented by Bulgaria.*

**Topic 6: Terrestrial drought: Heat waves, Risk effects on Ecosystems and Environment**

*7 talks on satellite monitoring of drought, heat waves and drought, vegetation stress are given. LS SAF Albedo product as related to drought was presented for first time.*

**Topic 7: Regional Applications**

*8 participants presented specific regional applications of MSG data and LSA SAF products for Slovenia, Armenia, Cyprus, Georgia, and Greece during the last session.*

A **Discussion** was conducted at the conclusion of each working day.

## **6) Workshop attendance**

33 participants and a small group accompanying Deputy Minister of the Ministry of Emergency Situations of the Republic during the opening ceremony attended workshop. 16 lecturers from 10 countries representing satellite agencies of EUMETSAS, LSA SAF, NOAA/NASA, NMS and Universities in Portugal, Italy, Israel gave high-level lecture support to the 5<sup>th</sup> SALGEE Workshop. These are remote sensing specialists, modellers, and teachers. 8 participants from Armenia, Cyprus, Georgia, Greece members of NMSs user community were attending as trainees. 9 additional participants from Armenia have attending the workshop on different days. Invitation letters, signed by the Armenian Hydromet Service Director were sent to all participants.

The full participants list is presented in **Appendix 2**.

## **7) Add value of the 5th SALGEE Workshop**

- Considering a new aspect of drought problem, accounting for the role of atmosphere dynamics; the link between heat waves and drought.
- Extend knowledge on LST satellite products from various platforms/algorithms including microwave measurements.
- Including the Albedo as new LSA SAF product for consideration in drought diagnoses.
- Including new fire algorithms S-VIIRS 375 m and S-VIIRS 750 m in comparative analyses.
- Enlarged institutional involvement in the SALGEE initiative with new members from: ECMWF; Estellus laboratory, Paris; Bar-Illan University, Israel.
- Extend the user community of LSA SAF products including new users (Cyprus) in the SALGEE user Group.
- Including Internet talks in the program that enabled broader lecturer support.



- Software for decoding and visualisation of S-VIIRS is developed by TSMS; it is planned this to be available for SALGEE community after request. This is a new approach that would facilitate the use of data over Eastern Europe.

## 8) Summary of the discussions: Recommendations for the next SAGEE activities

The recommendations proposed during the Discussion are in the scope to continue building and extending the SALGEE community. The topics under discussion are focused on the following aspects:

### 1. Satellite product availability

Accent is given on the necessity the new joining countries like Armenia, Georgia, Cyprus to start using **the available** LSA SAF products.

### 2. Products processing/visualization

The software for processing/visualization of S-VIIRS data distributed through EUMETCast for operational use developed by Turkish State Meteorological Service might be available for SALGEE member countries after request. It is accent on the importance of LSA SAF LST product for studying drought. The new introduced products like albedo will be considered in the future work on drought assessment. The microwave technique for LST will be considered in parallel. Interest in using the new fire risk product (reported by Prof. Carlos DaCamara) after some adjustments for different countries was expressed.

### 3. Role of land-atmosphere coupling to produce high impact weather: Heat Waves (HW) and land surface state anomaly, Synoptic phenomena, Fires

This is a new very important topic for our work in SALGEE. It is recommended this type of studies to be extended in the future. There are a lot of common problems for SEE countries and the result reported during the 5<sup>th</sup> Workshop on some dynamic features of land-atmosphere coupling is good to be used in the development of case studies examples for the next workshop.

### 4. Quantification of heat waves - drought effects with some focus on the role of soil moisture H-SAF (ECMWF) product for soil moisture.

A special interest was expressed in using the product of soil moisture, important for meteorological and hydrological purposes. In the future the work on this to be strengthen.

All presentations and materials are distributed among the participant in the 5<sup>th</sup> SALSEE workshop 2017 trough Dropbox linking.

Sofia,  
23 October 2017

SALGEE Secretary: .....

/Assoc.Prof. Dr. Julia (Stoyanova) Georgieva/  
NIMH-Bulgaria



## 5<sup>th</sup> SALGEE Workshop 2017



### MSG Land Surface Applications: Heat waves, Drought Hazard and Fire Monitoring

Yerevan, Ani Plaza Hotel, Armenia, 18 - 20 September 2017

18 September 2017

08:30 09:00 **Registration**

#### Topic 1

#### EUMETSAT activities in Land Surface Analyses

Chair: Jose Prieto

- |       |       |  |
|-------|-------|--|
| 09:00 | 09:15 | Workshop opening<br><i>Ministry of Emergency Situations of the Republic of Armenia</i>                       |
| 09:15 | 09:30 | Land Surface Monitoring in Armenia using Satellite Data<br><i>Levon Vardanyan, Armenian Hydromet Service</i> |
| 09:30 | 09:45 | EUMETSAT SALGEE Project in CDOP-3 Phase of LSA SAF<br><i>Julia Stoyanova, NIMH Bulgaria</i>                  |
| 09:45 | 10:00 | LSA SAF Programme: Status and development in CDOP-3<br><i>Luis Pessanha, LSA SAF Portugal</i>                |

#### Topic 2

#### Observation of land surface from space

- |       |       |   |
|-------|-------|---|
| 10:00 | 10:40 | Overview of operational LSA SAF products: Status and developments in CDOP-3.<br><i>Luis Pessanha, LSA SAF</i> |
|-------|-------|---|

10:40 11:10 **Break / Internet connection arrangement**

Chair: Carlos DaCamara

- |       |       |   |
|-------|-------|---|
| 11:10 | 11:40 | Land Surface Temperature estimates from infrared and microwave sensors<br><i>Ana Pires, IPMA, Portugal (Internet talk)</i>  |
| 11:40 | 12:10 | Toward an all-weather, long record, and real-time land surface temperature product from microwave satellite observations<br><i>Carlos Jimenez, Estellus, S.A.S., France</i> |
| 12:10 | 12:30 | Kalman filter for surface emissivity and temperature. Update of the application to the SEVIRI full disk<br><i>Sara Venafra, Univ Basilicata, Italy</i>                      |

12:30 14:00 **Lunch break**

#### Topic 3

#### Fire detection and monitoring – multimission

Chair: Luis Pessanha



14:00	14:30	How do satellites sense fire? <i>Jose Prieto, EUMETSAT</i>
14:30	15:10	LSA SAF Fire Radiative Power Product (capabilities, validation, applications) <i>Martin Wooster/ Weidong Xu, King's College, UK</i>
15:10	15:30	Evaluation of geostationary (EUMETSAT) versus polar orbiting (NASA-NOAA) missions for detection/monitoring of thermal anomalies over southeastern Europe <i>Christo Georgiev, NIMH Bulgaria</i>

15:30 16:00 **Break**

*Chair: Carmine Serio*

16:00	16:40	VIIRS and Landsat-class active fire algorithm update <i>Wilfrid Schroeder, Univ. Maryland, USA (Internet talk)</i>
16:40	17:10	Decoding Software Development for NOAA VIIRS Active Fire EDRs <i>Erdem Erdi, TSMS Turkey</i>

#### Topic 4

##### Land surface state and Atmosphere Dynamics

17:10	17:40	Dry intrusions in the environment of wild fires over Mediterranean as fire weather indicators <i>Christo Georgiev, NIMH, Bulgaria</i>
17:40	18:00	MSG and MODIS IR observations of land surface temperature and its interaction with atmospheric circulation in different scales <i>Itamar Lensky, Bar-Illan University, Israel</i>

19 September 2017

#### Topic 5

##### Using satellite information for diagnoses and forecast of fire risk

*Chair: Christo Georgiev*

09:00	09:40	An operational system of fire danger rating over Mediterranean Europe based on fire radiative power derived from Meteosat <b>Carlos DaCamara, Univ. Lisbon, Portugal</b>
09:40	10:10	Using satellite information (vegetation indices) for forecasting fire risk in Mediterranean forests <i>Itamar Lensky, Bar-Illan University, Israel</i>
10:10	10:30	Combined assessment of terrestrial drought and atmospheric conditions through a composite index for fire risk forecast <b>Julia Stoyanova, NIMH, Bulgaria</b>

10:30 11:00 **Break**

#### Topic 6

##### Terrestrial drought: Heat waves, Risk effects on Ecosystems and Environment

**Chair: Erdem Erdi**

11:00	11:20	Using land surface analyses to assess weather extremes: Heat waves and drought effects
-------	-------	--

*Julia Stoyanova, NIMH Bulgaria*

11:20	11:50	Drought monitoring with old and new satellites <i>Jose Prieto, EUMETSAT</i>
11:50	12:30	Albedo and Incoming solar radiation flux from LSA-SAF: Algorithms, validation and applications <i>Dominique Carrer / Florian Pinault, MeteoFrance, France</i>
12:30	14:00	<b>Lunch break</b> <i>Chair: Jose Prieto</i>
14:00	14:20	Annual and seasonal estimation of evapotranspiration from satellite and meteorological data <i>Itamar Lensky, Bar-Illan University, Israel</i>
14:20	14:30	Google Earth Engine <i>Itamar Lensky, Bar-Illan University, Israel</i>
14:30	15:00	Vegetation stress from IASI spectral radiances and Carbonyl Sulfide (OCS) retrievals <i>Carmine Serio, Univ. Basilicata, Italy</i>
15:00	15:20	Satellite data for drought assessment <i>Zara Petrosyan, Armenian Hydromet Service</i>
15:20	15:50	<b>Break / Internet connection arrangement</b> <i>Chair: Julia Stoyanova</i>
15:50	16:30	ECMWF soil moisture products for NWP, hydrology and drought applications <i>Patricia De-Rosnay, ECMWF, UK (Internet talk)</i>
16:30	17:00	The tragic fire event of June 17, 2017 in Portugal: the meteorological perspective <i>Carlos DaCamara, Univ. Lisbon, Portugal</i>

**Social event: Workshop dinner**

20 September 2017

Topic 7  
Regional Applications

*Chair: Zara Petrosyan*

09:00	09:30	Use of Vegetation Indexes from EUMETSAT satellites for Drought Management: Validation and Applications <i>Bostjan Muri, ARSO, Slovenia</i>
-------	-------	---



### Reports of NMSs participants

09:30	11:00	- Sona Hayrapetyan, Armenia ( <i>Satellite data for weather forecasting</i> )
		- Krystallia Dimitriadou, Greece
		- Matheos Papadakis, Cyprus ( <i>Satellite data use in weather forecasting</i> )
		- Taron Alexanyan, Armenia ( <i>Satellite data for drought assessment</i> )
		- Marina Kordzakhia, Gorgia ( <i>Drought Intensity in Georgia</i> )
		- Hasmik Kocharyan, Armenia ( <i>Use of Satellite Data in Crop Yield Forecasting and Environment Analysis</i> )
		- Yelena Khalatyan, Armenia ( <i>Use of Gridded Satellite Data for Climate Monitoring</i> )

11:00      11:30      **Break**

11:30      13:30      **General Discussion**

*Chair: Carlos DaCamara, Julia Stoyanova, Jose Prieto, Luis Pessanha*

## Appendix 2

### 5<sup>th</sup> SALGEE Workshop 2017 List of Participants

#### MSG LAND SURFACE APPLICATIONS: HEAT WAVES, DROUGHT HAZARD AND FIRE MONITORING

Yerevan, Ani Plaza Hotel, Armenia, 18 - 20 September 2017

#### List of Lecturers and Participants

No.	Country	Name	Organisation / Institute/Address
<b>LECTURERS</b>			
1	Bulgaria	Julia Stoyanova	Assoc. Prof. Dr. Julia (Stoyanova) Georgieva, Workshop co-organiser Forecasting Department and Information Service National Institute of Meteorology and Hydrology Tsarigradsko chaussee 66 1784 Sofia Bulgaria Phone: (+359 2) 462 4603 E-mail: <a href="mailto:Julia.Stoyanova@meteo.bg">Julia.Stoyanova@meteo.bg</a>
2	Portugal	Luis Pessanha	Dr. Luis Pessanha, LSA SAF Instituto Português do Mar e da Atmosfera, I.P. Rua C ao Aeroporto 1749-077 Lisboa

			Phone: +351 218 447 158 Fax: +351 218 462 199 E-mail: <a href="mailto:luis.pessanha@ipma.pt">luis.pessanha@ipma.pt</a>
3	Bulgaria	Julia Stoyanova	Prof. Carlos Da Camara Instituto Dom Luiz Faculdade de Ciências, Universidade de Lisboa Campo Grande, Edif. C8, Piso 3, Sala 8.3.04 1749-016 Lisboa, Portugal E-mail: <a href="mailto:cdcamara@fc.ul.pt">cdcamara@fc.ul.pt</a>
4	USA	Wilfrid Schroeder	Dr. Wilfrid Schroeder Research Associate Professor Dept of Geographical Sciences University of Maryland 4321 Hartwick Rd Suite 400 College Park MD 20740 USA phone: +1 301-314-1467 E-mail: <a href="mailto:wschroed@umd.edu">wschroed@umd.edu</a>
5	Bulgaria	Christo Georgiev	Prof. Christo Georgiev Chair, Forecasting Department and Information Service National Institute of Meteorology and Hydrology Tsarigradsko chaussee 66 1784 Sofia Bulgaria Phone: (+359 2) 462 4603 E-mail: <a href="mailto:Christo.Georgiev@meteo.bg">Christo.Georgiev@meteo.bg</a>
6	Italy	Carmine Serio	Prof. Carmine Serio Univ. Basilicata – School of Engineering, Italy Via dell'Ateneo Lucano, 10 85100 - Potenza E-mail: <a href="mailto:carmine.serio@unibas.it">carmine.serio@unibas.it</a>
7	Israel	Itamar Lensky	Itamar Lensky, Associate Prof. Chair, Department of Geography and Environment Bar-Ilan University Ramat-Gan 52900 Israel Office: +972-3-5317856, Lab: +972-3-5318342, Secretary: +972 3 531 8340, Fax: +972-3-5344430 Email: <a href="mailto:Itamar.Lensky@biu.ac.il">Itamar.Lensky@biu.ac.il</a>
8	UK	Weidong Xu	Weidong Xu Department of Geography, Kings College London, WC2R 2LS UK Mobile: +44 7889451510 E-mail: <a href="mailto:Weidong.xu@kcl.ac.uk">Weidong.xu@kcl.ac.uk</a>
9	UK	Patricia De-Rosnay	Patricia De-Rosnay ( <i>internet talk</i> ) Coupled Assimilation Team Leader European Centre for Medium-Range Weather Forecasts Tel: +44 118 949 9625 E-mail: <a href="mailto:patricia.rosnay@ecmwf.int">patricia.rosnay@ecmwf.int</a>
10	France	Carlos Jimenez	Carlos Jimenez Estellus, S.A.S. 93 Bl de Sebastopol F-75002 Paris, France +33 (0)1 40 51 20 25 Email: <a href="mailto:carlos.jimenez@estellus.fr">carlos.jimenez@estellus.fr</a>
11	France	Florian Pinault	Florian Pinault Meteo France Email: <a href="mailto:florian.pinault@meteo.fr">florian.pinault@meteo.fr</a> Fax: +33 561079477
12	Portugal	Ana Pires	Ana Pires ( <i>internet talk</i> ) Instituto Português do Mar e da Atmosfera, I.P.



			Rua C ao Aeroporto 1749-077 Lisboa, Portugal E-mail: <a href="mailto:ana.pires@ipma.pt">ana.pires@ipma.pt</a>
13	Turkey	Erdem Erdy	Erdem Erdy Turkish State Meteorological Service Remote Sensing Division CC:401 Ankara / TURKIYE Office: +90 312 3022624 Tel : +90 312 302 2624& Fax :+90 312 360 62 76 E-mail: <a href="mailto:eerdi@mgm.gov.tr">eerdi@mgm.gov.tr</a>
14	Italy	Sara Venafrà	Sara Venafrà, PhD Univ. Basilicata – School of Engineering, University of Basilicata 85100 – Potenza, Italy E-mail: <a href="mailto:sara.venafra@unibas.it">sara.venafra@unibas.it</a>
15	Armenia	Zara Petrosyan	Zarmandukht Petrosyan, Local co-organiser Service on Hydrometeorology and Active Influence on Atmospheric Phenomena of Armenia Head of Meteorological Centre 0002, Leo st.54,Yerevan, Armenia Tel: 37410 536021,37493383311 Fax:37410 532952 E-mail: <a href="mailto:edditaron@gmail.com">edditaron@gmail.com</a>
16	EUMETSAT	Jose Prieto	Jose Prieto, Workshop co-organiser EUMETSAT Eumetsat Allee 1 64295 Darmstadt Germany E-mail: <a href="mailto:jose.prieto@eumetsat.int">jose.prieto@eumetsat.int</a>
<b>PARTICIPANTS</b>			
17	Slovenia	Bostjan Muri	Bostjan Muri Slovenian Environment Agency, ARSO Vojkova 1b, 1000 Ljubljana, Slovenia E-mail: <a href="mailto:Bostjan.Muri@gov.si">Bostjan.Muri@gov.si</a>
18	Greece	Krystallia Dimitriadou	Krystallia Dimitriadou School of Geology, Aristotle University of Thessaloniki Thessaloniki, 54124, Greece E-mail: <a href="mailto:krystallia.dimitriadou@gmail.com">krystallia.dimitriadou@gmail.com</a>
19	Cyprus	Matheos Papadakis	Matheos Papadakis Department of Meteorology 28 Nikis Ave., 1086 Nicosia, Cyprus E-mail: <a href="mailto:mpapadakis@dom.moa.gov.cy">mpapadakis@dom.moa.gov.cy</a>
20	Georgia	Marina Kordzakhia	Marina Kordzakhia Hydrometeorological Service, Georgia E-mail: <a href="mailto:marinakordzakhia@gmail.com">marinakordzakhia@gmail.com</a>
21	Armenia	Yelena Khalatyan	Yelena Khalatyan Armenia
22	Armenia	Hasmik Kocharyan	Hasmik Kocharyan Armenia
23	Armenia	Sona Hayrapetyan	Sona Hayrapetyan Armenia
24	Armenia	Taron Alexanyan	Taron Alexanyan Armenia

25-33	Armenia	<b>Additional participants attending workshop on different days:</b>  Hamlet Melkonyan (Adviser to Hydromet Director) Hrach Astsatryan (Academy of Science) Arevik Haroutyunyan (Academy of Science) Aghavni Haroutyunyan (American University of Armenia) Mane Tapaltsyan (Adviser to Hydromet Director) Sona Grigoryan (Hydromet, Agrometeorological Division) Arthur Gevorgyan (Hydromet, Head of Division) Gohar Guloyan (Hydromet, Agrometeorological Division) Satenik Nazaryan (Hydromet, IT Specialist)
-------	---------	---