



Food and Agriculture  
Organization of the  
United Nations

# Managing salt-affected soils for sustainable future

## 2<sup>nd</sup> Meeting of the International Network of Salt-Affected Soils (INSAS)



**AGENDA** | Hybrid meeting  
| Tashkent/Nukus,  
Uzbekistan  
| May 22-26, 2023





# The second plenary meeting of the International Network of Salt-Affected Soils and the training of the Global Soil Laboratory Network on salt-affected soil analysis

*Tashkent/Nukus, 22-26 May 2023*

**Background.** The Global Soil Partnership (GSP), the sub-regional Eurasian Soil Partnership (EASP) and the FAO country office in Uzbekistan are jointly organizing three parallel meetings: the Sixth EASP Plenary Meeting, Second meeting of the International Network of Salt-Affected Soils (INSAS); and the training of the Global Soil Laboratory Network (GLOSOLAN) on salt-affected soil analysis in Tashkent, Uzbekistan.

The purpose of the **Second meeting of INSAS** will be to review the progress done by the network in the past two years (2021-2022) since INSAS' first virtual meeting, discuss and identify the priorities for the network, develop the work plan for 2023-2024, strengthen the cooperation between the members of INSAS, improve capacities of the members by trainings. The meeting will include four parts: (1) the workshop on salt-affected soils where the call for abstracts will be opened to all interested researchers/practitioners; (2) the technical sessions of working groups of INSAS on Assessment, Sustainable soil management, Water and Crops where the members of INSAS are expected to participate; (3) side events; (4) trainings on salt-affected soils (modeling solute transport in salt-affected soils; governance targeted at sustainable management of salt affected lands; mapping soil salinity with electromagnetic induction at the farm scale).

Day	INSAS	GLOSOLAN
May 22	International workshop on salt-affected soils: MANAGING SALT-AFFECTED SOILS FOR SUSTAINABLE FUTURE	
May 23	Technical sessions of INSAS	Technical session of GLOSOLAN and trainings in the laboratory
May 24	Side events and trainings	
May 25	Field trip to Aral Sea: Salt-affected soils management and restoration	
May 26	Field trip to the test plot: Salt-affected soils management and restoration	

<i>May 22</i>		
8:00 – 9:00	Registration	
<i>Session 1: Opening of the Conference</i>		
9:00 – 09:30	Welcome and Opening Remarks	
9:30 – 11:00	Keynote presentations	15-20 min each
11:00 – 11:30	Coffee break	
11:30 – 13:00	<i>Session 2: Oral speeches</i>	
13:00 – 13:15	<i>GROUP PHOTO</i>	
13:15 – 14:30	Lunch	
14:30 – 16:00	<i>Session 3: Poster session</i>	
16:00 – 16:30	Coffee break	
16:30 – 18:00	<i>FAO/SW&amp;FS Partnership: Global Campaign on Salinization (tbc)</i>	
<i>May 23</i>		
<i>Technical session of INSAS</i>		
9:00 – 9:30	Report on the INSAS work in 2021-2022	Maria Konyushkova, GSP Secretariat
9:30 – 10:30	Planning by Working group 1: SAS&Assessment: Mapping, assessing and monitoring of salt-affected soils	Members of WG1
10:30 – 11:00	Coffee break	
11:00 – 12:00	Planning by Working group 2: SAS&SSM: Sustainable management of salt-affected soils (practices, policy)	Members of WG2
12:00 – 13:00	Planning by Working group 3: SAS&Crops: Halophyte agriculture and salt-tolerant crops and plants	Members of WG3
13:00 – 13:15	GROUP PHOTO	
13:15 – 14:30	Lunch	
14:30 – 15:30	Planning by Working group 4: SAS&Water:	Members of WG4
15:30 – 17:00	Summary and finalization of the INSAS' work	all
17:00 – 17:30	Coffee break	
17:30 – 18:00	Summary and finalization of the INSAS' work	all
18:00 – 18:30	Closing remarks	INSAS Chair

**May 24**  
**Venue: City Palace, Tashkent, Uzbekistan**

*Trainings on salt-affected soils*

<b>8:30 – 10:00</b>	<b>Sustainable management practices: Stakeholder identification and impact</b>	<b>Katarzyna Negacz, INSAS Vice-Chair, IVM Vrije Universiteit Amsterdam, Assistant Professor</b>
<b>10:00 – 11:00</b>	<b>Water flow and solute transport using hydrological models</b>	<b>Meisam Rezaei, INSAS Vice-Chair, Soil and Water Research Institute, Assistant Professor</b>
<b>11:00 – 11:30</b>	<b>Coffee break</b>	
<b>11:30 – 13:00</b>	<b>Water flow and solute transport using hydrological models (cont'd)</b>	<b>Meisam Rezaei, INSAS Vice-Chair, Soil and Water Research Institute, Assistant Professor</b>
<b>13:00 – 13:15</b>	<b>GROUP PHOTO</b>	
<b>13:15 – 14:30</b>	<b>Lunch</b>	
<b>14:30 – 17:00</b>	<b>EM Inversion Modelling for 2-D and 3-D salinity mapping</b>	<b>John Triantafilis, Portfolio Leader Managing Land &amp; Water, Manaaki Whenua – Landcare Research</b>
<b>17:00 – 17:30</b>	<b>Coffee break</b>	
<b>20:00</b>	<b>Departure to Nukus</b>	
<b>May 25 - 26</b> <b>Nukus, Uzbekistan</b>		
<b>7:00 – 22:30</b>	<b>Field trip to former Aral Sea area: saline agriculture and restoration of degraded</b>	
<b>23:50</b>	<b>Arrival back to Tashkent</b>	

# GLOSOLAN training on the analysis of salt-affected soils

Tashkent, Uzbekistan | May 23, 2023

Venue: Soil composition and repository, quality analysis center, Tashkent, Uzbekistan		
8:30 – 9:00	Registration	
<i>Session 1: Opening of the workshop and GSP overview</i> <i>Moderator: Filippo Benedetti</i>		
9:00 – 09:30	Welcome and Opening Remarks	Uzbekistan Agriculture representative
<i>Session 2: Technical session of the Global Soil Laboratory Network (GLOSOLAN)</i> <i>Moderator: Filippo Bendetti</i>		
9:30 – 9:50	Introduction to the Global Soil Laboratory Network (GLOSOLAN)	GLOSOLAN Chair
9:50 – 10:10	GLOSOLAN-INSAS collaboration: What we did, what we will do	Filippo Benedetti, GSP
10:10 – 10:40	GLOSOLAN's Standard Operating Procedures (SOPs) on electrical conductivity (EC), pH, saturated soil paste extract,	TBC
10:40 – 11:00	Coffee break	
11:00 – 12:00	Lecture: Quality control and quality assurance (QA/QC)	TBC
12:00 – 12:30	Introduction to the GLOSOLAN proficiency test for Eurasia 2023	TBC
12:30 – 12:45	Group picture	
12:45 – 14:00	Lunch	
14:00 – 14:30	Participating to international proficiency tests: <ul style="list-style-type: none"><li>• Common errors</li></ul>	TBC

### Session 3: Training at the Soil lab of Uzbekistan

14:30 – 15:00	Training on the implementation of the GLOSOLAN SOP on electrical conductivity (EC) and saturated soil paste extract	TBC
15:00 – 16:00	Training on the implementation of the GLOSOLAN SOP on soil pH (in H <sub>2</sub> O, in KCl, in CaCl <sub>2</sub> )	TBC
16:00 – 17:00	Training on the implementation of the GLOSOLAN SOP on Boron by hot water extraction	TBC
17:00 – 17:30	Coffee break	
17:30-18:30	Training on the measurement of Total Soluble Salts (TSS) and exchangeable sodium percentage (ESP)	TBC
18:30-19:00	Reflections of the day	

## Trainings

### Sustainable management practices: Stakeholder identification and impact

Trainer: Katarzyna Negacz, INSAS Vice-Chair, IVM Vrije Universiteit Amsterdam, Assistant Professor at the Department of Environmental Policy Analysis

Objectives: Salinisation is one of the major soil degradation processes influencing human livelihoods and food systems. Monitoring of salt-affected soils, sustainable management practices and projects conducted on these soils often involve assessment of socio-economic impacts. Therefore, in this workshop we will show how to identify stakeholders and measure the impact of your practice or project on them, based on the example of cost-benefit analysis. Further, we will discuss how to include socio-economic analysis in your project/study and investigate its viability for further upscaling.

# Water flow and solute transport training using hydrological model

Trainer: Meisam Rezaei, INSAS Vice-Chair, Soil and Water Research Institute, Assistant Professor

Objectives: A detailed conceptual and mathematical description of water flow and solute transport processes in the vadose zone and groundwater will be given during the first part of the course. Hands-on computer sessions will then provide participants an opportunity to become familiar with the windows-based HYDRUS computer software packages, including several additional modules, such as the ROSETTA, UNSATCHEM, and Wetlands modules. The training will include:

- Introduction of modeling approach and hydrological models
- Introduction to variably-saturated water flow and solute transport processes (conceptual and mathematical description)
- Review of the hydraulic properties of unsaturated porous media and introduction RETC and ROSETTA to estimate hydraulic properties
- Introduction to HYDRUS-1D software package, its modules and its application for simple one-dimensional problems

Audience: multi-disciplinary experts and students.

Tentative duration: 2.5 h

## Laptops are required to perform this training

Minimum System Requirements:

- Operating Systems: Windows 11 (64-bit), or Windows 10 (64-bit), or Windows 8 (64-bit)
- X64 CPU with 2 GHz
- 2 GB RAM
- 10 GB total hard disk capacity with about 500 MB reserved for installation
- Graphic card with a resolution of 1280 x 800 pixels

**For further information and to download the model, please visit:**

<https://www.pc-progress.com/en>

# EM Inversion Modelling for 2-D and 3-D salinity mapping

Trainer: John Triantafilis, Portfolio Leader Managing Land and Water, Manaaki Whenua Landcare Research Aotearoa New Zealand

**Objectives:** Training will be provided on use of electromagnetic (EM) induction instruments and data to create digital soil maps of soil physical, biological, chemical, and hydrological properties. Focus will be on the use of EM4Soil inversion software to estimate depth specifics and its use to develop 2-d and 3-d inversion models. A hands-on computer session will provide participants an opportunity to become familiar with the EM4Soil computer software package, including the inversion of EM data from EM instruments. The training will include:

- Introduction to theory of operation of electromagnetic (EM) induction instruments and measurement of apparent electrical conductivity (ECa – mS/m)
- Introduction to commercially available EM instruments including Geonics (e.g., EM38, EM31 and EM34) and DUALEM (e.g., DUALEM1, and DUALEM421)
- Introduction to demonstrated case studies in the use of ECa to create digital soil maps of soil physical (e.g., clay, silt and sand), biological (e.g., SOC), chemical (e.g., salinity) and hydrological (e.g., volumetric moisture content)

**Audience: multi-disciplinary experts and students.**

**Tentative duration: 2.5 h**

**Laptops are required to perform the inversion modelling and to fill in e-document.**

Minimum System Requirements:

- Operating Systems: Windows 11 (64-bit), or Windows 10 (64-bit), or Windows 8 (64-bit)
- X64 CPU with 2 GHz
- 2 GB RAM
- 10 GB total hard disk capacity with about 10 MB reserved for installation of demonstration version of EM4Soil software
- Graphic card with a resolution of 1280 x 800 pixels

For further information and to download the model, please visit: Home ([emtomo.com](http://emtomo.com))

For further information contact: [triantafilisj@landcareresearch.co.nz](mailto:triantafilisj@landcareresearch.co.nz)





The Global Soil Partnership (GSP) is a globally recognized mechanism established in 2012. Our mission is to position soils in the Global Agenda through collective action. Our key objectives are to promote Sustainable Soil Management (SSM) and improve soil governance to guarantee healthy and productive soils, and support the provision of essential ecosystem services towards food security and improved nutrition, climate change adaptation and mitigation, and sustainable development.

Land and Water Division  
GSP-secretariat@fao.org  
www.fao.org/global-soil-partnership

**Food and Agriculture Organization of the United Nations**  
Rome, Italy



The International Network of Salt-Affected Soils (INSAS), launched in 2019 during the International Center for Biosaline Agriculture's (ICBA) first Global Forum on Innovations for Marginal Environments, is a Technical Network of the Global Soil Partnership (GSP) and follows its Rules of procedure. The Network aims to facilitate the sustainable and productive use of salt-affected soils for current and future generations. INSAS's mission is to support and facilitate joint efforts towards the sustainable management of SAS for food security, agricultural sustainability and climate change mitigation.

