International Symposium on Isotope Hydrology:

Sustainable Water Resources in a Changing World

3–7 July 2023

DRAFT PROGRAMME

IAEA Headquarters Vienna, Austria

MONDAY, 3 JULY 2023

12:00–14:00 OPENING SESSION **BR-C**

Time	Name	Designating Member State/Organization	Title of Presentation
12:00-12:30	**TBC**	IAEA	Welcome and Opening Remarks
12:30–13:00	**J. Cullmann**	World Meteorological Organization (WMO)	*Keynote*: Title TBD
13:00–13:30	**C. Stumpp**	Germany	*Keynote*: Securing Water Resources for the Future – Opportunities and Challenges in the Use of Isotopes for Sustainable Water Management
13:30–14:00	**Y. Wada**	Saudi Arabia	*Keynote*: Opportunities and Constraints for Improved Water Resources Management Using Different Lenses and Scales
14:00–14:30	*Coffee/Tea Break*		

MONDAY, 3 JULY 2023

14:30–16:00 **Session 1: Isotopes in Hydrosphere-Atmosphere Interactions I** **BR-C**

Chairpersons: **C. Hughes, Australia**
L. Araguás Araguás, IAEA

Time	Paper No.	Name	Designating Member State/Organization	Title of Presentation
14:30–15:00	380	**A. Cauquoin**	Japan	*Keynote*: Implementation of Tritium in the Atmospheric General Circulation Model (AGCM) MIROC5-Iso to Investigate the Dynamics of the Hydrological Cycle
15:00–15:15	367	**R. Sanchez-Murillo**	USA	Isotope Network of Tropical Tempestology (Storm): The Genesis and Development of Collaborative Research across the Intra-America Seas and the Eastern Pacific Ocean
15:15–15:30	489	**D. Wang**	France	What Controls the 3D Distribution of Atmospheric Vapor Isotopes in East Asia
15:30–15:45	533	**H. Bong**	Japan	Process-based Quantification of Uncertainty in Water Isotope Models
15:45–16:00	482	**S. Chakraborty**	India	Association of Precipitation Isotopes and the Tropospheric Heating Over the Indian Monsoon Domain
16:00–16:30		*Coffee/Tea Break*		

MONDAY, 3 JULY 2023

16:30–18:00 **Session 2:** **BR-C**
Application of Isotope Age Tracers to Evaluate Water Residence Time

Chairpersons: **C. Wilkse, Australia**
T. Matsumoto, IAEA

Time	Paper No.	Name	Designating Member State/Organization	Title of Presentation
16:30–17:00	614	**J. Clark**	USA	*Keynote*: Quantifying Groundwater Travel Time Near Managed Recharge Operations Using S-35 as an Intrinsic Tracer
17:00–17:15	407	**A. Suckow**	Australia	Gas Tracers in Arid Regions: Do they Really Indicate Recharge?
17:15–17:30	552	**K. Osenbrück**	Germany	Age and Hydrochemical Evolution of Deep Groundwater in the Mekong Delta, Vietnam
17:30–17:45	507	**T. Kivits**	Netherlands	Determining the Vulnerability of Public Drinking Water Supplies with Multi-tracer Age Dating
17:45–18:00	398	**Á.E. Sveinbjörnsdóttir**	Iceland	Groundwater Hydrological Mapping and Water Residence Time within the Young Basaltic Icelandic Crust

18:00–20:00 **Workshop 1:** **C0739**
Conceptual Model Development for Isotope Hydrology and Water Resource Management

Workshop 2: **G-1, IHL**
Nitrate Isotopes as Tracers of N-pollution and Cycling in Aquatic Systems

TUESDAY, 4 JULY 2023

08:45–10:30 **Session 3:** **BR-C**
Isotopes in Water Quality Studies I

Chairpersons: **F. Huneau, Fance**
Y. Vystavna, IAEA

Time	Paper No.	Name	Designating Member State/Organization	Title of Presentation
08:45–09:15	619	**V. Re**	Italy	*Keynote*: Fingerprinting Human Impact on Groundwater Resources: How to Integrate Isotope Hydrology and Socio-hydrogeology
09:15–09:30	500	**M. Caschetto**	Italy	Groundwater Ages Distribution Along an Alluvial Basin Aquifer: How Age Estimates can Guide Nitrate Mitigation in Groundwater?
09:30–09:45	611	**S. Kebede Gurmessa**	South Africa	Tracing Urban Pipe Water Residence Time and Movement Using Environmental Isotopes (Δ18o-Δ2h,222rn) and Electrical Conductivity – A New Frontier for Urban Water Supply Risk Mapping
09:45–10:00	353	**D. Gooddy**	UK	Phosphate Oxygen Isotopes are Pivotal in Multi-isotope Advances for Diagnosing Nutrient Cycling and Sources
10:00–10:15	498	**I. Vadillo**	Spain	Use of Environmental Isotopes (Δ18o-H2o, Δ2h-H2o and Δ13c-Dic) to Understand the Fate of Emerging Organic Contaminants and Other Organic Contaminants in Water Resources (Case Studies from Southern Spain)
10:15–10:30	586	**B. Mayer**	Canada	Isotopic Tracing of Sources and Fate of Nitrate, Methane and Ethane in Groundwater in Alberta, Canada
10:30–11:00		*Coffee/Tea Break*		

TUESDAY, 4 JULY 2023

11:00–12:45 **Session 4:** **BR-C**
Revisiting the Role of Tritium as a Tracer of Hydrological Processes

Chairpersons: **A. Lamb, UK**
L. Copia, IAEA

Time	Paper No.	Name	Designating Member State/Organization	Title of Presentation
11:00–11:30	625	**I. Cartwright**	Australia	*Keynote*: Determining Transit Times in Dynamic Environments using Tritium
11:30–11:45	493	**U.G. Morgenstern**	New Zealand	Tritium as Tracer in a Post-Bomb Hydrologic Cycle – Complex Groundwater Age Distributions and Dating of Stream and River Water
11:45–12:00	477	**H.P. Broers**	Netherlands	Tritium Based Travel Time Distributions and Nitrate Forecasts in Dutch Chalk Springs
12:00–12:15	424	**B. Raco**	Italy	Tritium Analysis: A Sound Tool to Assess Leachate Contamination in Water
12:15–12:30	561	**M. Gusyev**	Japan	Using Environmental Isotopes to Understand Hydrological Processes in the Naymant Valley and Balgas Red Lake Depressions of Mongolia Gobi Region
12:30–12:45	524	**L. Palcsu**	Hungary	Preliminary Results of the Tritium Profile at Glacier Colle Gnifetti, Swiss-Italian Alps: Link to the Solar Cycle
12:45–14:00		*Lunch Break*		

TUESDAY, 4 JULY 2023

14:00–16:00 **Session 5:** **BR-C**
Advances in Noble Gas Applications for Groundwater Dating

Chairpersons: **D.K. Solomon, USA**
I. Kuhn, IAEA

Time	Paper No.	Name	Designating Member State/Organization	Title of Presentation
14:00–14:30	576	**D. Pinti**	Canada	*Keynote*: Multi-isotopic Approach for Dating Groundwater in the Laurentides, Southern Quebec, Canada
14:30–14:45	562	**T. Chambers**	Australia	Radiokrypton Measurements at the Australian Atom Trap Trace Analysis Facility
14:45–15:00	588	**A. Seltzer**	USA	A New Analytical Technique for Groundwater Kr and Xe Isotope Ratios Provides a Window into Physical Processes at the Water Table
15:00–15:15	465	**C. Wilske**	Australia	Noble Gas Analyses of Fluid Inclusions in the Deep Hiltaba Suite Granite (South Australia) Point towards Fluid Circulation on the Billion Year Time Scale
15:15–15:30	391	**D.E. Martínez**	Argentina	Dating Old Groundwater with Kr-81 and C-14 in Deep Aquifers in Argentina as a Contribution to Constrain the He-4 Application for Determining Residence Time
15:30–15:45	430	**F. Meienburg**	Australia	Update on Argon Trap Trace Analysis – Value of Ar-39 Measurements in Various Environmental Systems
15:45–16:00		Roundtable Discussion		
16:00–16:30		*Coffee/Tea Break*		

TUESDAY, 4 JULY 2023

16:30–17:45 **Session 6: Developments in Isotope Analytical Techniques** **BR-C**

Chairpersons: **L. Copia, IAEA**
TBC

Time	Paper No.	Name	Designating Member State/Organization	Title of Presentation
16:30–17:00	409	**A. Lamb**	UK	*Keynote*: Advances in Sulfur Isotope Measurements – Progress and Applications for Hydrological Science
17:00–17:15	374	**N. Williams**	UK	Unravelling Isotopologue Ratios with the New Orbitrap Exploris™ Isotope Solutions
17:15–17:30	575	**O. Schilling**	Switzerland	The Potential of Combining Isotope Analyses with Online Noble Gas and Microbial Tracer Methods for Hydrogeological Investigations
17:30–17:45	481	**D.K. Solomon**	USA	Cosmogenic Production of ^{3}He during Ultra-Low-Level Tritium Measurements by ^{3}He Ingrowth

18:00–20:00 ***Welcome Reception & GloWAL Presentation*** ***Rotunda***

WEDNESDAY, 5 JULY 2023

08:45–10:30 **Session 7:** **BR-C**
Isotopes in Water Quality Studies II

Chairpersons: **S. Kebede Gurmessa, South Africa**
Y. Vystavna, IAEA

Time	Paper No.	Name	Designating Member State/Organization	Title of Presentation
08:45–09:15	628	**F. Huneau**	France	*Keynote*: Combining Multi-isotope Tracing with Organic Compounds to Improve Pollution-sources Tracking of Groundwater Resources in Africa and the Mediterranean, Impact on Aquifer Management Strategies
09:15–09:30	337	**D. Pant**	India	Impact of High Agricultural Activity on the Groundwater Quality of Southwest Punjab, India
09:30–09:45	442	**M. Manzano**	Spain	Tracking Contaminant Sources in Groundwater Discharging to the Mar Menor Coastal Lagoon (SE Spain)
09:45–10:00	508	**M.D. Nowbuth**	Mauritius	Major Ion Chemistry and Isotope Hydrology of Surface Waters in the Grand River North West Catchment, Mauritius
10:00–10:15	559	**L. Bouchaou**	Morocco	Understanding Groundwater Salinization and Recharge Processes in the Essaouira Coastal Aquifer, Morocco
10:15–10:30	375	**J. Ikonen**	Finland	Behavior of Li, S and Sr Isotopes in the Subterranean Estuary and Seafloor Pockmarks of the Hanko Submarine Groundwater Discharge Site in Finland, Northern Baltic Sea
10:30–11:00	*Coffee/Tea Break*			

WEDNESDAY, 5 JULY 2023

11:00–12:45 **Session 8:** **BR-C**
Isotopes in Groundwater Hydrology

Chairpersons: **G.P. Flores Avilés, Bolivia**
U. Saravana Kumar, IAEA

Time	Paper No.	Name	Designating Member State/Organization	Title of Presentation
11:00–11:30	327	**G.P. Flores Avilés**	Bolivia	*Keynote*: Contribution of Isotope Hydrology to the Knowledge of Transboundary Aquifer Systems in the Plurinational State of Bolivia
11:30–11:45	361	**M.A.A. Mohamd**	Sudan	Evaluation of Recharge and Groundwater Resources in the Area Eastern of Bara Basin, Sudan
11:45–12:00	545	**M. Raiber**	Australia	Using Environmental Tracers (^{14}C, ^{36}Cl and ^{81}Kr) to Assess Recharge and Connectivity Processes in the Great Artesian Basin, Australia
12:00–12:15	363	**A. García-Moya**	Cuba	Assessing Water Salinization in a Coastal Aquifer of Cuba, an Approach Based on Hydrochemical and Isotopic Characterization of its Waters
12:15–12:30	372	**D. Al-Sha'rat**	Jordan	Isotope Applications – Artificial Groundwater Recharge from the Dams
12:30–12:45		Roundtable Discussion		
12:45–14:00		*Lunch Break*		

WEDNESDAY, 5 JULY 2023

14:00–16:00 **Session 9:**
Integrating Isotope Techniques and Advanced Modelling Approaches

BR-C and Rotunda

Chairpersons: **J. Podgorski, Switzerland**
A. Harjung, IAEA

Time	Paper No.	Name	Designating Member State/Organization	Title of Presentation
14:00–14:30	620	**I. Ouedraogo**	Burkina Faso	*Keynote*: Integrating Isotope Techniques and Advanced Modelling Approaches
14:30–14:45	579	**J. Podgorski**	Switzerland	Aquifer Vulnerability Assessment Using Tritium and Machine Learning
14:45–15:00	504	**I. Kuhn**	Brazil	Groundwater Time-series and its Correlation to Stable Isotopes at Southern Outcrop Area of Guarani Aquifer System (GAS)
15:00–15:15	530	**M. Tanoue**	Japan	Global Cloud-system-resolving Model Equipped with Stable Water Isotopes (NICAM-WISO)
15:15–15:30	595	**G.J. Bowen**	USA	Isotopic Heterogeneity in U.S. Urban Supply Systems Reflects Climatic, Environmental, and Sociodemographic Factors
15:30–15:45	609	**A. Watson**	South Africa	Developing a Water and Isotope Flux Module for the Jams/J2000iso Model
15:45–16:00	349	**E. Adar**	Israel	Assessing the Spatial Distribution of an Aquifer's Transmissivity and Storativity from Isotopes and Hydrochemistry Using a Mixing Cells Modeling Approach
16:00–16:30		*Coffee/Tea Break*		*Rotunda*

16:30–18:00 **Poster Session I** **Rotunda**

18:00–20:00 **Workshop 1:**
Innovative Devices for Gas Measurement Applications in Isotope Hydrology

G-1, IHL
(Meeting Point:
IAEA stand, Rotunda)

Workshop 2:
Isotope-enabled Modelling with JAMS/J2000iso, Demo for IAEA Training Workshop

C0739

THURSDAY, 6 JULY 2023

08:45–10:30 **Session 10: Understanding Surface Water – Groundwater Interaction Using Isotope Tracers** **BR-C**

Chairpersons: **V. Re, Italy**
U. Saravana Kumar, IAEA

Time	Paper No.	Name	Designating Member State/Organization	Title of Presentation
08:45–09:15	616	**L. Ortega**	IAEA	*Keynote*: Isotopes Key to Unravelling Groundwater-Surface Water Interactions in the Esteros del Iberá Wetland Area, Argentina
09:15–09:30	571	**C.N. Wacuka**	Kenya	Evaluation of Surface-Groundwater Interaction using Stable Isotopes in Kinale, Loromo and Kikuyu Areas of Kiambu County, Kenya
09:30–09:45	419	**P.E. Lartsey**	Ghana	Application of Isotope Techniques to Groundwater Resources Management in the North-Western Part of the Volta River Basin of Ghana
09:45–10:00	505	**M. Beyer**	Germany	Vegetation Controls Spatial Patterns of Soil Water Isotopes in a Tropical Dry Forest and UAV's Can Help to Predict Them
10:00–10:15	416	**O. Bogdevici**	Republic of Moldova	Source, Age and Recharge Patterns of Groundwater in SE Europe
10:15–10:30		Roundtable Discussion		
10:30–11:00		*Coffee/Tea Break*		

THURSDAY, 6 JULY 2023

11:00–12:45 **Session 11: Isotopes in Hydrosphere-Atmosphere Interactions II** **BR-C**

Chairpersons: **R. Sanchez-Murillo, USA**
M. Vital, IAEA

Time	Paper No.	Name	Designating Member State/Organization	Title of Presentation
11:00–11:30	395	**A.M. Durán-Quesada**	Costa Rica	*Keynote*: Stable Isotope Composition of Rainfall: Insights of Extreme Events
11:30–11:45	510	**C. Gerber**	Australia	Up-cycling Isotope Data Sets to Improve and Verify Multiple Isoscapes in Australia
11:45–12:00	583	**J.D. Van Rooyen**	South Africa	Stable and Radiogenic Isotopes in Southern Mozambique: A Window into Groundwater Recharge, Mixing and Vulnerability
12:00–12:15	332	**M. Ramos**	Brazil	Water Stable Isotopes Tracking Flowpaths in the Headwaters of São Francisco River, Minas Gerais, Brazil
12:15–12:30	573	**C. Műller**	Germany	Drought Impacts on the Nitrogen Dynamics in a Mesoscale Watershed in Central Europe – Insights from Stable Isotope Investigations
12:30–12:45	457	**C. Voigt**	Spain	Disentangling Hydrological and Climatological Controls of Ephemeral Lakes in Southern Spain Using Triple Oxygen Isotopes
12:45–14:00		*Lunch Break*		

THURSDAY, 6 JULY 2023

14:00–16:00 **Session 12: Applications of Isotopes in Climate Change Studies** **BR-C and Rotunda**

Chairpersons: **TBC**
O. Kracht, IAEA

Time	Paper No.	Name	Designating Member State/Organization	Title of Presentation
14:00–14:30	631	**T. Vennemann**	Switzerland	*Keynote*: Whole wood H- and O-isotope Compositions of Trees Proximal to Rivers Draining Alpine Catchments Provide Evidence of Increased Glacial Melt Water Proportions due to Global Climate Change
14:30–14:45	343	**J.A. Corcho Alvarado**	Switzerland	Anthropogenic Radionuclides to Study the Age of the Ice in Two Swiss Glaciers
14:45–15:00	502	**C. Ditlevsen**	Finland	Understanding the Role of Snowmelt Water in a Changing Climate with Isotope Hydrology
15:00–15:15	564	**I. Fórizs**	Hungary	Application of Stable Water Isotopes on the Kis-Balaton Water Protection System, Hungary
15:15–15:30	439	**S. Cisse Ep Faye**	Senegal	Groundwater Recharge and the Intensification of Rainfall under Climate Change: Evidence from an Urban Groundwater Observatory in Dakar, Senegal
15:30–15:45	444	**T. Marković**	Croatia	Isotope Fingerprint Change in Precipitation and Groundwater due to Climate Change
10:15–10:30		Roundtable Discussion		
16:00–16:30		*Coffee/Tea Break*		*Rotunda*
16:30–18:00		**Poster Session II**		**Rotunda**
18:00–20:00		**Workshop 1: New Developments in Tritium (^{3}H) Analysis by Electrolytic Enrichment and Liquid Scintillation Counting (LSC)**		**G-1, IHL** (Meeting Point: IAEA booth, Rotunda)
		Workshop 2: Introducing a Comprehensive Modular Laboratory Information Management System for Isotope Analyses (IsoWorks)		**C0739**

FRIDAY, 7 JULY 2023

08:45–10:30 **Session 13:** **BR-C**
Role of Isotope Hydrology in Water Resources Management

Chairpersons: **HE J.F. Facetti, Paraguay**
J. Miller, IAEA

Time	Paper No.	Name	Designating Member State/Organization	Title of Presentation
08:45–09:15	629	**T. Stadnyk**	Canada	*Keynote*: Enabling and Strengthening Science-based Policies for Water Resource Management
09:15–09:30	371	**Y. Llerena Padrón**	Cuba	Cuban Experience in the Use of Isotope Hydrology as a Scientific-Technical Tool for the Evaluation of the Water Resources Sustainability
09:30–09:45	463	**Z. Rafiei-Sarmazdeh**	Iran, Islamic Republic of	Essential of Isotope Hydrology Policy-making in Iran's Water Resource Management Issue
09:45–10:00	592	**R. Kirchheim**	Brazil	New Findings using Noble Gases Isotopes in the Guarani Aquifer System in South America
10:00–10:15	551	**C. Hughes**	Australia	Precipitation and Groundwater d2H and d18O Isoscapes to Support Water Management in NSW, Australia
10:15–10:30		Discussion		TBD
10:30–11:00		*Coffee/Tea Break*		

FRIDAY, 7 JULY 2023

11:00–13:05 SYMPOSIUM DISCUSSION, OUTCOMES & CLOSING SESSION **BR-C**

Time	Name	Designating Member State/Organization	Title of Presentation
11:00–11:30	**N. Raasakka**	United Nations Environment Programme (UNEP)	*Keynote*: The Importance of Water Quality for National Water Management
11:30–12:00	**J. Miller**	IAEA	
12:00–12:30		Discussion	
12:30–13:00	**J. Miller**	IAEA	Symposium Outcomes
13:00–13:05		Director, Division of Physical and Chemical Sciences, Department of Nuclear Applications and Sciences, IAEA	Closing Remarks