

THURSDAY, OCTOBER 22

PRE-CONGRESS ACTIVITIES

ONLINE

Virtual Technical Courses | Free Access for Registered to The Congress

10:00 –
12:30

Integrated Water Resource Management: Implications from a Shared Perspective

Claudio Reyes, Bárbara Stubing y Nathalie Jamett ,
SMI Chile



SMIICEChile

FRIDAY, OCTOBER 23

PRE-CONGRESS ACTIVITIES

ONLINE

Virtual Technical Courses | Free Access for Registered to The Congress

10:00 –
13:30

Glaciers in the Arid Andes: Dynamics and Monitoring in Mountain Environments

Zulma Menna y Roberto del Castillo, Universidad
Nacional de San Juan, Argentina



Universidad
Nacional
de San Juan

MONDAY, OCTOBER 26

PRE-CONGRESS ACTIVITIES

ONLINE

Virtual Technical Courses | Free Access for Registered to The Congress

15:00 –
18:00

Groundwater, its Management and Impact on Ecosystems

Dr. José Luis Arumí, CRHIAM, Universidad de Concepción, Chile



Course 1: Integrated Water Resource management: Implications from a Shared Perspective

Claudio Reyes, Senior Consultant senior, AWUA, Chile; **Bárbara Stubing**, Researcher in Social Performance and Resource Governance, SMI Chile; **Nathalie Jamett**, Senior Researcher and leader of responsible production and optimization of mining processes, SMI Chile

WHEN	LANGUAGE	LENGTH
Thursday, October 22	Spanish	2,5 hours

DESCRIPTION

Water management in territories with multiple users, especially in contexts of water scarcity, faces increasing challenges that require comprehensive and collaborative approaches. This course provides a holistic view of water management, beginning with the fundamental principles that underpin the balance between resource availability, its multiple uses, and territorial governance. It then analyzes the main challenges associated with water management and their implications for the various stakeholders in the territory. Based on this analysis, the course delves into the shared solutions approach, with a special emphasis on shared water infrastructure as a strategy to optimize water use, reduce costs and socio-environmental impacts, and generate sustainable benefits for multiple users. Finally, participants will develop an applied activity based on a specific territory, using a practical tool to identify opportunities for implementing shared water infrastructure and support decision-making aimed at more efficient, collaborative, and resilient water resource management.

GENERAL OBJECTIVES

1. Understand the fundamentals of water management and its role in balancing availability, uses, and territorial governance.
2. Identify the main territorial challenges associated with water, their implications for the different actors in the territory, and the limitations of isolated solutions compared to integrated management.
3. Apply the shared solutions approach, using a practical tool to evaluate shared water infrastructure alternatives that optimize costs, reduce socio-environmental impacts, and generate benefits for multiple users in the territory.

CONTENT AND PROGRAM

10:00 – 10:05	Welcome, objectives and agenda	Course Coordinator
10:05 – 10:25	Module 1: Fundamentals of water management	Claudio Reyes, AWUA
10:25 – 10:35	Questions and discussion for Module 1	
10:35 – 10:45	Break 1	
10:45 – 11:05	Module 2: Territorial challenges in water management	Bárbara Stubing, SMI Chile
11:05 – 11:15	Questions and discussion for Module 2	
11:15 – 11:25	Break 2	
11:25 – 11:40	Module 3: Introduction to shared water infrastructure	Nathalie Jamett, SMI Chile
11:40 – 12:25	Practical activity with the management tool	Course Team
12:25 – 12:30	Conclusions and closing	Course Coordinator

LECTURER(S) BIO

Claudio Reyes – AWUA

Forestry Engineer, MSc, with 30 years of professional experience. He specializes in strategic water resource planning, having developed strategic plans for half of the water consumed in Chile. He has been an FAO consultant in integrated water resources management, an international scientific advisor for the Lima and Callao Water Fund (AquaFondo), and Director of the Diploma Program in Strategic Water Resources Planning at the Catholic University of the Holy Conception.

Bárbara Stubing

Social Worker and Bachelor of Social Work from the Pontifical Catholic University of Chile, where she is currently pursuing a Master's degree in Social Work. She has specialized training in sustainable development, territorial public policy, social research, and public participation.

Her experience focuses on facilitating dialogue processes with Indigenous communities and multisectoral stakeholders, participatory methodologies, community relations, territorial leadership, water governance, and

collaborative project design. She has held coordination, research, teaching, and consulting positions at institutions such as Territorio Común, the UC Center for Public Policy, UNESCO, the Ministry of Education (MINEDUC), and the National Institute for Human Rights (INDH). She currently works as a researcher in the area of Social Performance and Resource Governance at SMI Chile.

Nathalie Jamett

Is a Chemical Civil Engineer and holds a PhD in Mineral Process Engineering from the University of Antofagasta. She has extensive experience in the formulation and development of applied research projects. She also holds a diploma in data science and machine learning from the Pontifical Catholic University of Chile. Her expertise focuses on the mathematical modeling and optimization of processes, with applications in the development of computational tools. She currently works as a Senior Researcher and leads the Responsible Production and Mining Process Optimization team at SMI Chile.

Course 2: Glaciers in the Arid Andes: Dynamics and Monitoring in Mountain Environments

Zulma Menna, Research Professor, Universidad Nacional de San Juan, Argentina; **Roberto del Castillo**, Research Professor, Universidad Nacional de San Juan, Argentina

WHEN

Friday, October 23

LANGUAGE

Spanish

LENGTH

3 hours

DESCRIPTION

The course will address the role of glaciers in the arid Andes and their importance in water resource management in mountain environments. Fundamental concepts of glaciology, glacial dynamics, and climate change will be presented, along with monitoring and characterization methodologies. Applied experiences in glacier inventories, glacial retreat analyses, and mass balance studies in watersheds of the province of San Juan will also be discussed. The course will further include a review of the Argentine legal framework related to glaciers and the periglacial environment, and its implications for water management and the development of high-altitude projects..

GENERAL OBJECTIVES

1. Recognize glaciers in the arid Andean basins of the Andes mountain range.
2. To understand the dynamics and mass balance of glaciers in relation to climate change j.
3. Identify glacier inventory and monitoring tools applicable to environmental management.

CONTENT AND PROGRAM

10:00 - 10:50	Module 1 - Glaciological fundamentals and regulatory framework	Zulma Menna/Omar del Castillo
10:50 - 11:00	Questions and discussion for Module 1	
11:00 - 11:10	Break 1	
11:10 - 12:00	Module 2 - Inventories, glacial dynamics and climate change	Zulma Menna/Omar del Castillo
12:00 - 12:10	Questions and discussion for Module 2	
12:10 - 12:20	Break 2	
12:20 - 13:10	Module 3 - Advanced glacier monitoring and applications	Zulma Menna/Omar del Castillo
13:10 - 13:20	Questions and discussion for Module 3	
13:20 - 13:30	Conclusions and closing	Course Coordinator

LECTURER(S) BIO

Zulma Menna

Civil Engineer specializing in Hydraulics, graduated from the Faculty of Engineering at the National University of San Juan. Specialist in Occupational Health and Safety. Specialist in Water Technologies. More than 30 years of university teaching experience, currently a Full Professor exclusively in the undergraduate program at the Department of Civil Engineering of the UNSJ, teaching General Hydraulics and Fluvial and Experimental Hydraulics, and also teaching at the postgraduate level. Researcher at the Institute of Hydraulic Research (IDIH) of the Faculty of Engineering at the National University of San Juan. Extensive experience directing projects in the field of surface water resources and glaciers. Expertise in satellite image processing and GIS. Currently the Deputy Director of this Institute.

Omar del Castillo

Civil Engineer – Hydraulics Specialization. Director of the Hydraulic Research Institute at the Faculty of Engineering of the National University of San Juan. Scientific Advisor to the Center for Research, Development and Innovation for Integrated Water Management in Arid Regions (CIGIAA). Full Professor, exclusive dedication. Undergraduate Lecturer in the Department of Civil Engineering and Agricultural Engineering (UNSJ).

Course 3: Groundwater, its Management and Impact on Ecosystems

Dr. José Luis Arumí, Tenured Professor, Director of the Department of Water Resources and Principal Researcher of the Fondap CRHIAM Center; Universidad de Concepción, Chile

WHEN

Monday, October 26

LANGUAGE

Spanish

LENGTH

3,5 hours

DESCRIPTION

This course provides knowledge about groundwater systems, their management, and their relationship with ecosystems. Through the study of different case studies from the northern, central, and southern regions of Chile, it analyzes aspects related to the formation of groundwater systems, their dynamics, recharge mechanisms (natural and artificial), and background information on groundwater management within the framework of current regulations..

GENERAL OBJECTIVES

1. Present the current challenges for the supply of drinking water.
2. Present non-traditional water sources as viable alternatives for municipal water supply and for industry.
3. Present seawater desalination technologies, including global and regional production statistics, energy consumption, costs, pretreatment, water quality, and environmental considerations.

CONTENT AND PROGRAMME

15:00 - 15:00	Welcome and Introduction to the Course	Course Coordinator
15:00 - 15:50	Module 1. Groundwater in the hydrological cycle. Definition of groundwater systems: Basic concepts such as energy; porosity and permeability; groundwater formations; Darcy's law. Application to the macrozones of Chile. Generation of baseflow; ecological importance of groundwater	José Luis Arumi
15:50 - 16:00	Questions and discussion for Module 1	

16:00 - 16:10	Break 2	
16:10 - 17:00	Module 2. Natural and Artificial Groundwater Recharge. Analysis of methodologies for estimating groundwater recharge; case studies in the Coastal Range, irrigation zone, and Andes Mountains. Artificial groundwater recharge	José Luis Arumi
17:00 - 17:10	Questions and discussion for Module 2	
17:10 - 17:20	Break 3	
17:20 - 18:10	Module 3. Groundwater Management in Chile. Legal principle of stream unity; Water User Organizations; definition of SHACs; gaps for integrated groundwater management	José Luis Arumi
18:10 - 18:20	Questions and discussion for Module 3	José Luis Arumi
18:20 - 18:30	Conclusions and closing	José Luis Arumi

LECTURER(S) BIO

José Luis Arumi

Civil Engineer, Doctor in Engineering, Professor of the Department of Water Resources of the University of Concepción. Principal Investigator of the CHRIAM Center, Associate Investigator of the Water Resources Consortium for the South Central area, and member of the Center for Environmental Law and Climate Change.

My main lines of interest are: 1) Study of hydrological processes; ii) Monitoring and modeling of the interaction between surface and underground hydrological systems iii) Management of water resources in the Central zone of Chile. Professor of the subjects of Hydrology, Groundwater, Hydrological Processes in Ecosystems and Water Resources Management. Supervision of 106 undergraduate students, 19 master's students and 20 doctoral students. Research focused on the study of hydrological processes in the Central zone of Chile and on water management through OAUs. Author of 91 publications in mainstream magazines and 151 publications in Chilean and international conferences.