

Civil Hydraulics and Aquatic Issues

Mohammad Javad OSTAD MIRZA TEHRANI
Assistant Professor / Young Research Scholar
KNTU / KUTB

On the Woody Debris Retention, Challenges and Innovations

Abstract Biography

Thursday, 22 December 2022 (۱۴۰۲) ۱۲:۳۰-۱۳:۳۰
Meeting room, 3rd floor, Building A, Faculty of Civil Engineering

Civil Hydraulics and Aquatic Issues

Sustainable Development in Action: Empowering Marginalized Communities to Influence Environmental Policy

Laila MOSLEH
Ex-Post Doctoral Researcher, UCLA, USA
Assistant Professor, University of Tehran, Tehran, Iran

Maryam ZAREH SHAHNEH
Assistant Professor
ALBA LAB, KNTU, Tehran, Iran

Thursday, 29 April 2023 (۱۴۰۳) ۱۲:۳۰-۱۳:۳۰
Meeting room, 3rd floor, Building A, Faculty of Civil Engineering

Civil Hydraulics and Aquatic Issues

The Implementation of Tehran Stormwater Management Master Plan

Behnaz SHADI
Water and Wastewater Department Manager
Senior Consulting Engineer
Tehran, Iran

Karim ALIZAD
Assistant Professor
SHENS LAB, KNTU
Tehran, Iran

Thursday, 27 May 2023 (۱۴۰۳) ۱۲:۳۰-۱۳:۳۰
Meeting room, 3rd floor, Building A, Faculty of Civil Engineering

Civil Hydraulics and Aquatic Issues

Interactions of Engineering Doctoral Students with Faculty in the US

Sona GHOLIZADEH
Postdoctoral Research Assistant
Water Masters Laboratory (WML), KNTU
Tehran, Iran

Mohammad Javad OSTAD MIRZA TEHRANI
Assistant Professor, Director
Water Masters Laboratory (WML), KNTU
Tehran, Iran

Friday, 14 December 2023 (۱۴۰۳) ۱۲:۳۰-۱۳:۱۵
Meeting room, 3rd floor, Building A, Faculty of Civil Engineering

Civil Hydraulics and Aquatic Issues

From Opportunism to Strategy: Planning Nature-Based Solutions in Cities

Salar HAGHGHATAFISHAR
Assistant Professor, Director
Kristianstad University/Waters
Kristianstad, Sweden

Mohammad Javad OSTAD MIRZA TEHRANI
Assistant Professor, Director
Water Masters Laboratory (WML), KNTU
Tehran, Iran

Thursday, 23 December 2023 (۱۴۰۳) ۱۲:۳۰-۱۳:۱۵
Meeting room, 3rd floor, Building A, Faculty of Civil Engineering

Civil Hydraulics and Aquatic Issues

Systemic Complexities of Sustainable Development: Cross-Continental Case Studies

Amin KHALILI MIAB
Ex-Post Doctoral Researcher
ETHZ,
Zurich, Switzerland

Mohammad Javad OSTAD MIRZA TEHRANI
Assistant Professor
Water Masters Laboratory (WML), KNTU
Tehran, Iran

Thursday, 18 February 2023 (۱۴۰۳) ۱۲:۳۰-۱۳:۳۰
Meeting room, 3rd floor, Building A, Faculty of Civil Engineering

Civil Hydraulics and Aquatic Issues

Water and CO2 Foot-Prints in Renewable Energy Applications

Ali SOHANI
Senior Ph.D. Researcher
University of Rome Tor Vergata,
Rome, Italy

Mohammad Javad OSTAD MIRZA TEHRANI
Assistant Professor
Water Masters Laboratory (WML), KNTU
Tehran, Iran

Thursday, 06 May 2023 (۱۴۰۳) ۱۲:۳۰-۱۳:۳۰
Meeting room, 3rd floor, Building A, Faculty of Civil Engineering

Civil Hydraulics and Aquatic Issues

Water for All: From Reality to Implementation

Abdolhossein BERENJI
Secretary of the Water Peace Association & Founder of the Shohrad-Water Museum

Mikael Modir Rousta
Director of the Water and Peace Group, Iranian Peace Studies Scientific Association

Thursday, 26 June 2023 (۱۴۰۳) ۱۲:۳۰-۱۳:۳۰
<https://www.kntu.ac.ir/hy/news/144-kntu-epd/epd/pea>

Civil Hydraulics and Aquatic Issues

Fully Automated Flood Inundation Mapping in Data Scarce Regions

Ashin FOULADI SEMNAN
Postdoctoral Research Assistant
Water Masters Laboratory (WML), KNTU
Tehran, Iran

Mohammad Javad OSTAD MIRZA TEHRANI
Assistant Professor, Director
Water Masters Laboratory (WML), KNTU
Tehran, Iran

Thursday, 16 December 2023 (۱۴۰۳) ۱۲:۳۰-۱۳:۱۵
Meeting room, 3rd floor, Building A, Faculty of Civil Engineering

Civil Hydraulics and Aquatic Issues

Recent Global Research Trends in AI and Its Applications in Real-World Challenges

Mahdi M. KALAYEH
Senior Research Scientist
Nvidia,
California, USA

Karim ALIZAD
Assistant Professor
SHENS LAB, KNTU
Tehran, Iran

Thursday, 25 February 2023 (۱۴۰۳) ۱۲:۳۰-۱۳:۳۰
Meeting room, 3rd floor, Building A, Faculty of Civil Engineering

Civil Hydraulics and Aquatic Issues

Dams Safety Evaluation for Sultanate of Oman, Considering Climate Change and Recent Dam Failure in Libya

Ahmed MOHEBZADEH
Senior Hydrologist and Hydraulic Engineer
VA International LLC
Muscat, Oman

Karim ALIZAD
Assistant Professor
SHENS LAB, KNTU
Tehran, Iran

Saturday, 17 May 2023 (۱۴۰۳) ۱۲:۳۰-۱۳:۳۰
Meeting room, 3rd floor, Building A, Faculty of Civil Engineering

Civil Hydraulics and Aquatic Issues

Insights from Installing the Brine Discharge Marine Pipeline in Bandar Abbas, Iran

Mohammad Reza TEHRANI FARAGI
CEO, Project Manager & Site Manager
FARAB Construction,
Tehran, Iran

Saeid HEDAJOURI
Senior Engineer

Haji MOHAMMADZADEH
Senior Engineer

Karim ALIZAD
Assistant Professor
SHENS LAB, KNTU
Tehran, Iran

Monday, 17 November 2023 (۱۴۰۳) ۱۲:۳۰-۱۳:۳۰
Meeting room, 3rd floor, Building A, Faculty of Civil Engineering

Civil Hydraulics and Aquatic Issues

Swiss Inland Water Bodies Monitoring and Modeling: Current Status, Challenges, and Opportunities

Abolfazl IRANI RAHAGHI
Senior Researcher
Eawag Swiss Federal Institute of Aquatic Science and Technology & University of Zurich (ETHZ),
Zurich, Switzerland

Mohammad Javad OSTAD MIRZA TEHRANI
Assistant Professor, Director
Water Masters Laboratory (WML), KNTU
Tehran, Iran

Saturday, 20 December 2023 (۱۴۰۳) ۱۲:۳۰-۱۳:۳۰
Meeting room, 3rd floor, Building A, Faculty of Civil Engineering

Civil Hydraulics and Aquatic Issues

Assessing Groundwater Decline under CMIP6 Scenarios using Fuzzy Logic-Based Approach: A Case Study of the Varamin Plain, Iran

Maryam GOLNARI
Ph.D. Researcher
KNTU
Tehran, Iran

Naimeh SADEGHI
BEST Lab, Assistant Professor
KNTU
Tehran, Iran

Roza ASADI
Assistant Professor
KNTU
Tehran, Iran

Thursday, 09 March 2023 (۱۴۰۳) ۱۲:۳۰-۱۳:۳۰
Meeting room, 3rd floor, Building A, Faculty of Civil Engineering

Civil Hydraulics and Aquatic Issues

Applications of 3D Printing and Its Industry Job Market

Ehsan SHARIATI RAD
Instructor and Leading Expert in Additive Manufacturing (AM)
Tehran, Iran

Shabnam SADRJI MOGHADDAM
Assistant Professor
SHNS LAB, KNTU
Tehran, Iran

Thursday, 20 May 2023 (۱۴۰۳) ۱۲:۳۰-۱۳:۳۰
Meeting room, 3rd floor, Building A, Faculty of Civil Engineering

Civil Hydraulics and Aquatic Issues

Management of Water Scarcity in Tehran

S. Oveis TORABI
Head
Urban Usability Think Tank
Tehran, Iran

Mikael MODIRROUSTA
Director, Scholar of Hydrologist
Water & Peace Group
Tehran, Iran

Thursday, 09 December 2023 (۱۴۰۳) ۱۲:۳۰-۱۳:۳۰
<https://www.kntu.ac.ir/hy/news/144-kntu-epd/epd/pea>

Civil Hydraulics and Aquatic Issues

Deployment of Direct-Reduction Reactors for DRI (Sponge Iron) Production

Davood AHMADVAND
Project Manager
Fargipart Part Co.
Tehran, Iran

Karim ALIZAD
Assistant Professor
SHENS LAB, KNTU
Tehran, Iran

Monday, 21 December 2023 (۱۴۰۳) ۱۲:۳۰-۱۳:۱۵
Meeting room, 3rd floor, Building A, Faculty of Civil Engineering

Swiss Inland Water Bodies Monitoring and Modeling: *Current status, Challenges, and Opportunities*

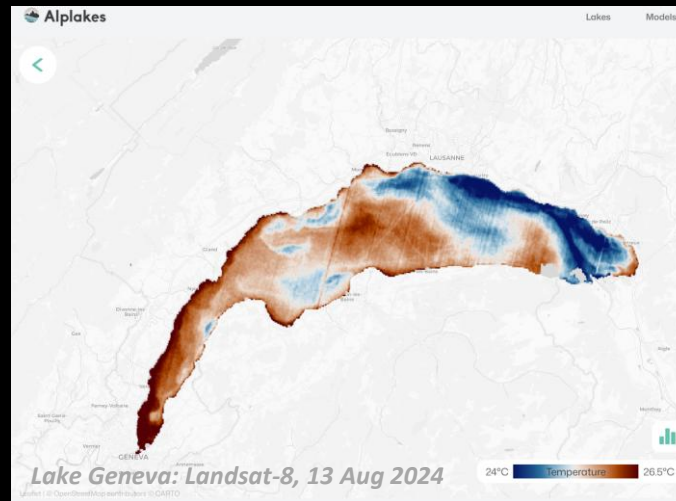
Abolfazl Irani Rahaghi^{1,2}, Daniel Odermatt^{1,2}

¹ Eawag, Swiss Federal Institute of Aquatic Science and Technology, Surface Waters – Research and Management, Dübendorf, Switzerland

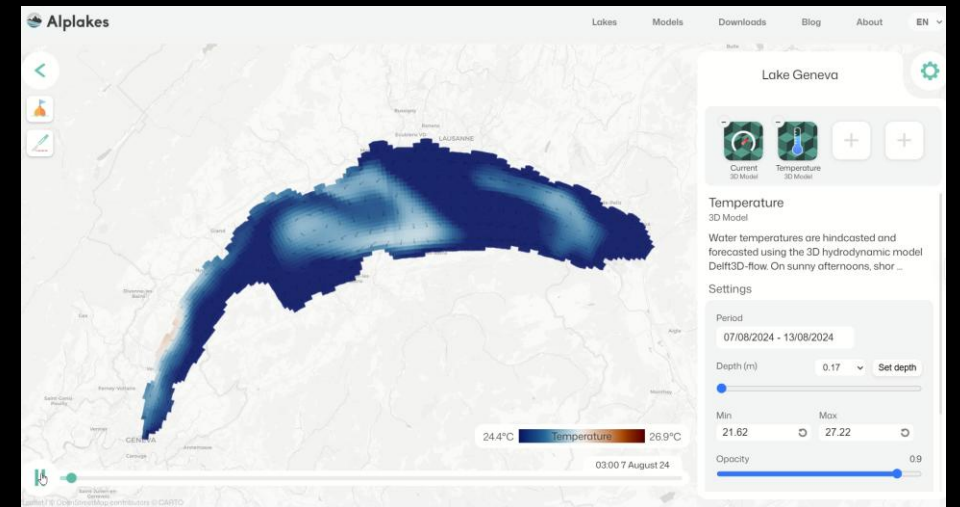
² Department of Geography, University of Zurich, Zurich, Switzerland



In situ data



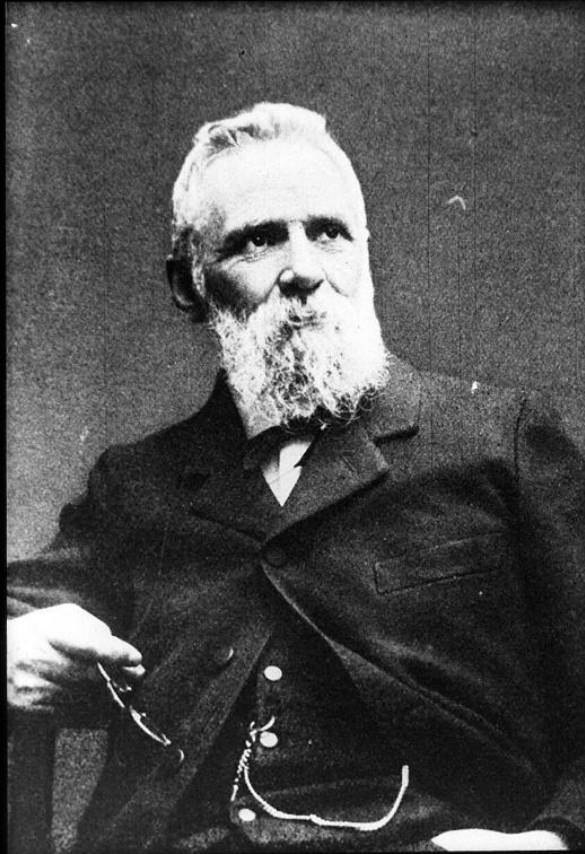
Remote sensing



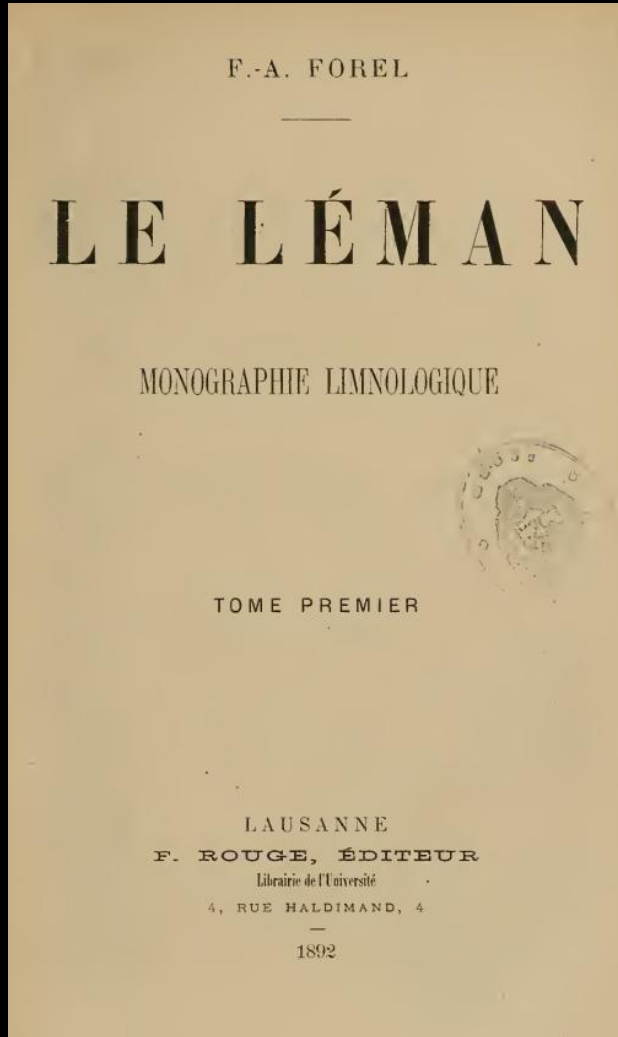
Numerical models

abolfazl.irani@eawag.ch

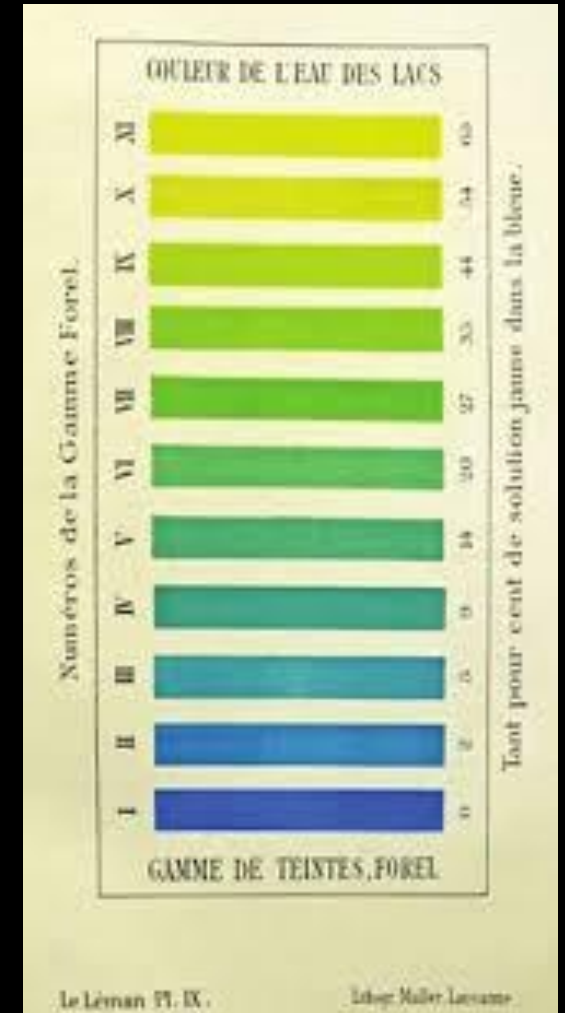
History of limnology in Switzerland



**François-Alphonse Forel (1841-1912;
Morges, Switzerland)**



Forel, F.-A. 1892. Le Léman - Monographie Limnologique. Tome I, Editions Rouge Lausanne, Lausanne, 543p

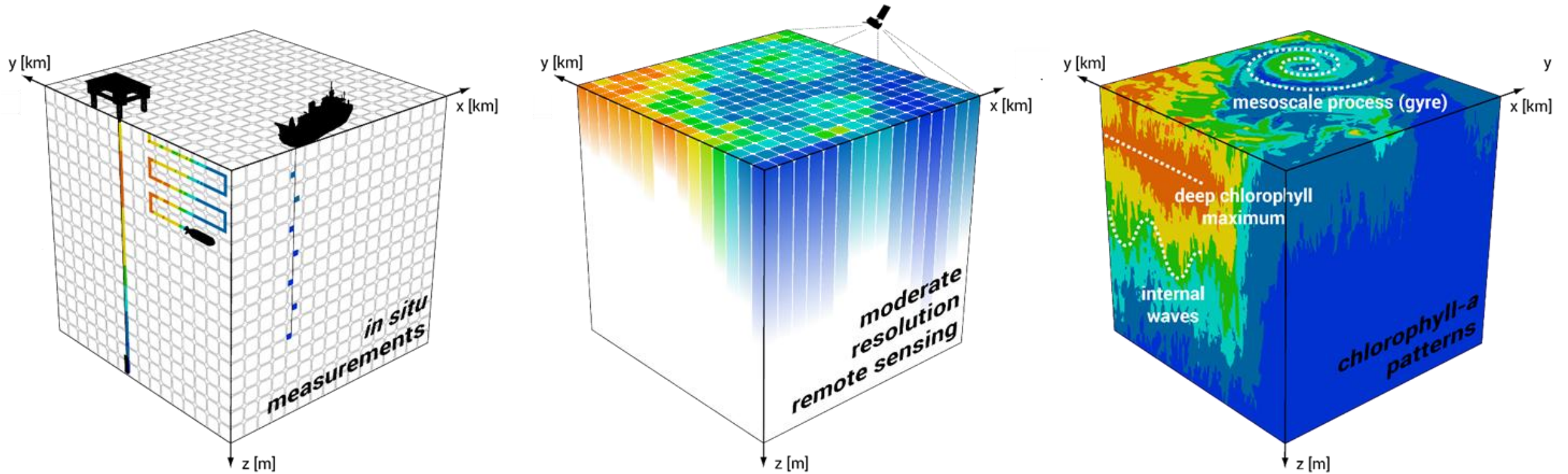


The Forel scale for lake color



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Main sources of information



- Perhaps the most reliable source of information
- Sparse in space (and maybe in time)
- Expensive (especially for the researchers)

- Good spatial information
- Poor temporal frequency
- Usually with high uncertainty

- Great temporal (and spatial) coverage
- Usually inexpensive
- Predictive capability
- “All models are wrong, some are useful”; George Box (1919-2023)

Figure from Odermatt et al., Diversity II water quality parameters from ENVISAT (2002–2012): A new global information source for lakes, *Earth Syst. Sci. Data*, 10, 1527–1549,

Forecasts and monitoring of alpine lakes

- 3D Model
- 1D Model
- Satellite
- Insitu

Sort 243 results

Lake Geneva

11.9°	11.9°	11.8°	11.5°	11.3°
Today	Sun	Mon	Tue	Wed

Lake Constance

9.8°	9.8°	9.8°	9.6°	9.5°
Today	Sun	Mon	Tue	Wed

Lake Garda

14°	14°	14°	13.9°	13.8°
Today	Sun	Mon	Tue	Wed

Lake Neuchâtel

11°	11°	10.9°	10.7°	10.5°
Today	Sun	Mon	Tue	Wed

Lake Maggiore

13.9°	13.9°	13.8°	13.7°	13.6°
Today	Sun	Mon	Tue	Wed

Lake Como

14.3°	14.2°	14.2°	14°	13.9°
Today	Sun	Mon	Tue	Wed



Available products on AlpLakes

Water quality: Chl-a, Turbidity, and Secchi depth from Sentinel-2/3 | A.I. Rahaghi, M. Werther, D. Odermatt

Physical parameters: LSWT from Landsat-8/9 | A.I. Rahaghi, D. Odermatt

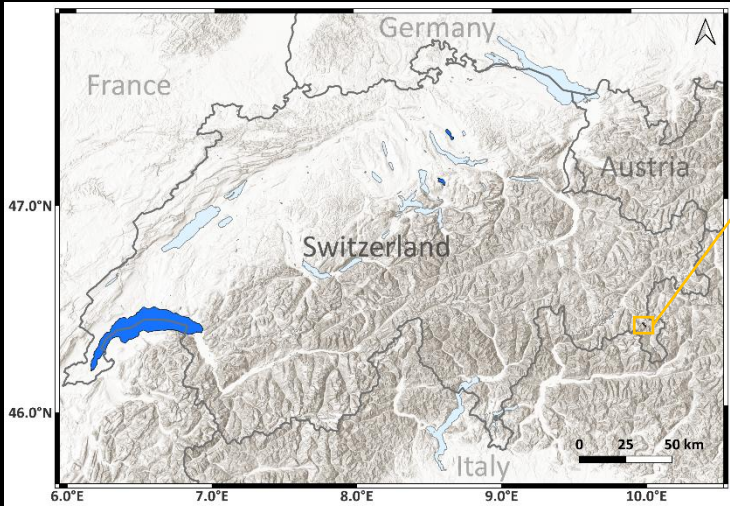
3D model and Particle tracking: Hydrodynamics from Delft-3D | A.I. Rahaghi, M. Amadori, D. Bouffard

1D model : Hydrodynamics & Bio-geochemistry from Simstrat | F. Bärenbold, , M. Schmid

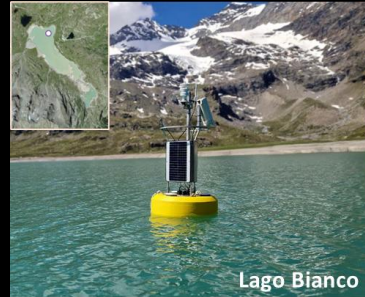
In situ data: Various from Different sensors  More detailed data on <https://www.datalakes-eawag.ch/>

Almost all data and codes are freely available!

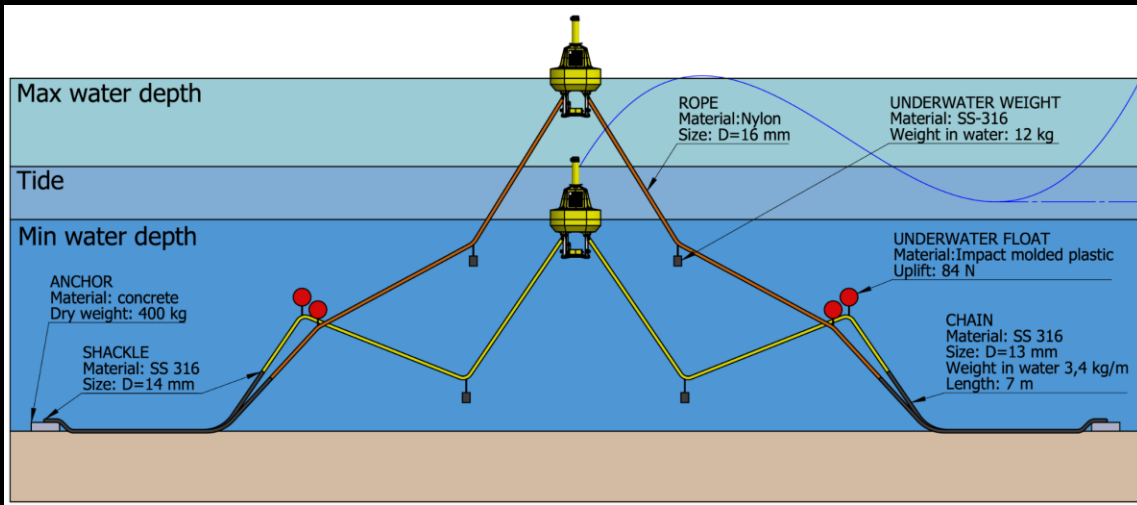
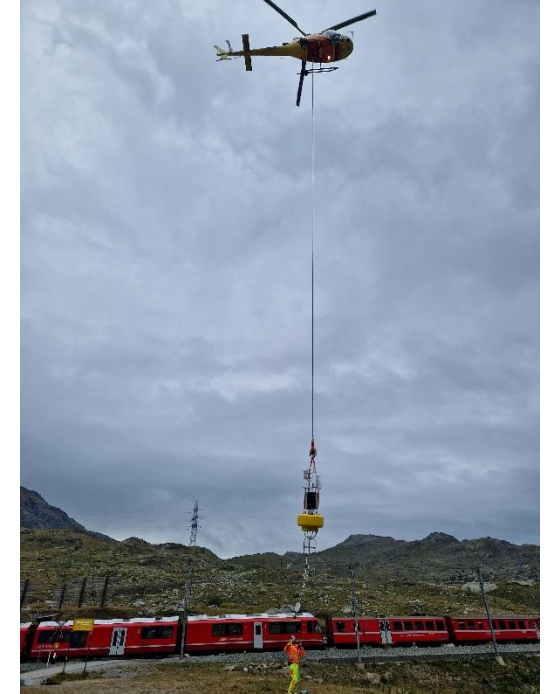
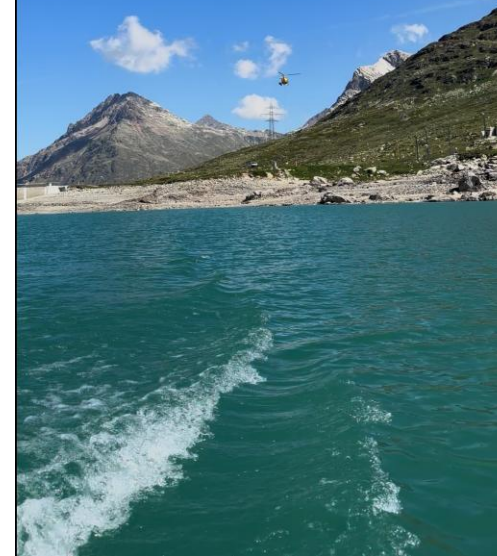
In situ measurement challenges: The case of Lago Bianco



Lago Bianco (2234 m)



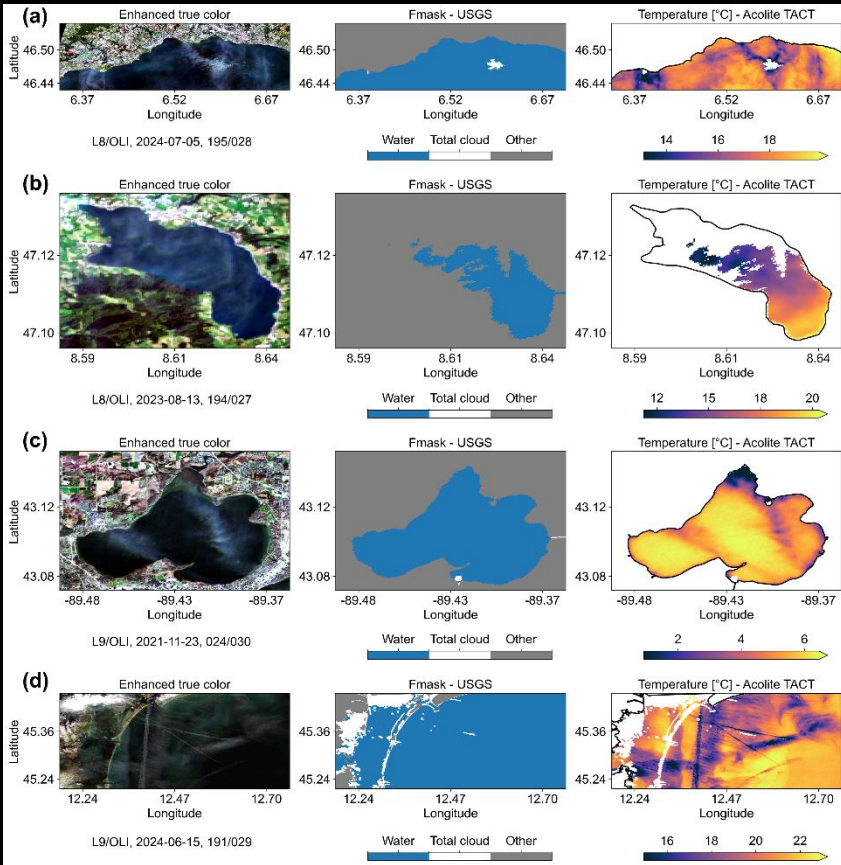
Buoy deployment (Spring)



Buoy removal (Fall)

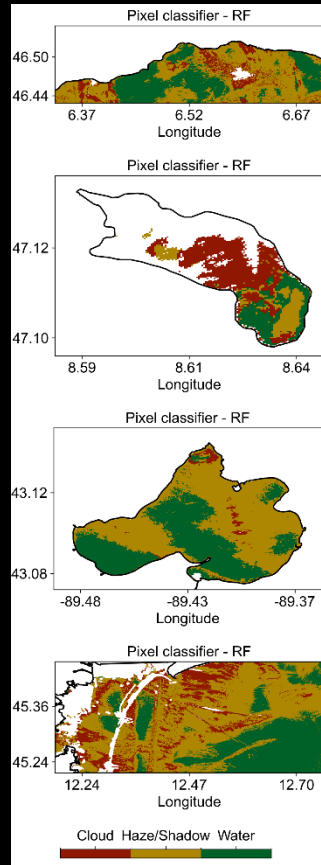


Remote sensing challenges: Some examples from diverse lakes

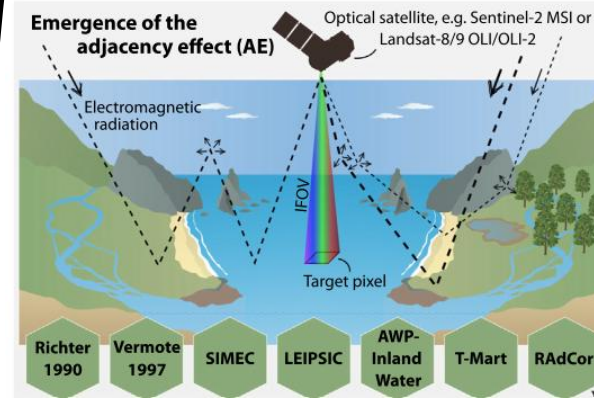


Thin clouds issue

Irani Rahaghi et al., In preparation.

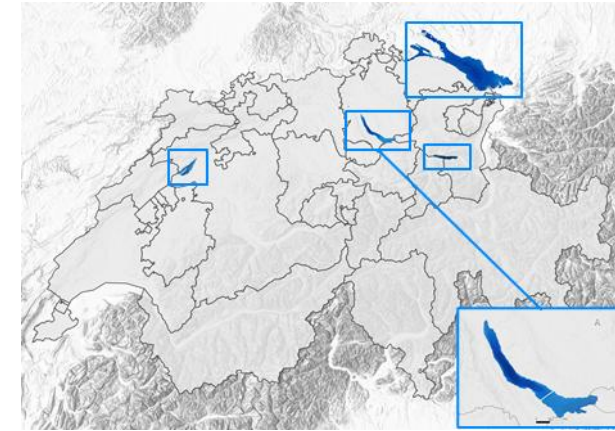


Machine Learning approach

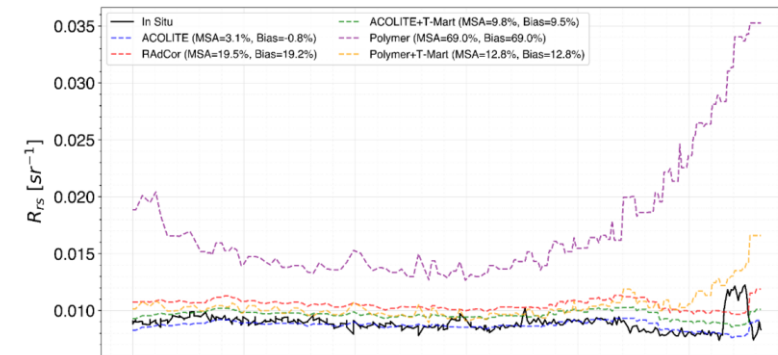


Lion et al., 2025

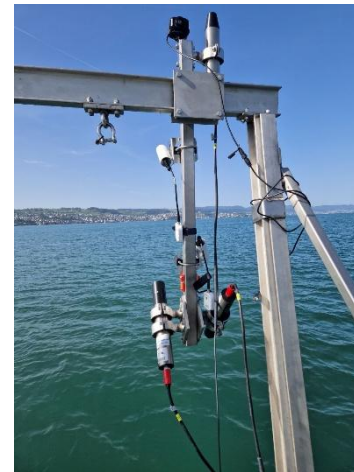
- Adjacency effect issue
- Transects in four Swiss lakes
- Algorithms assessment



482 nm



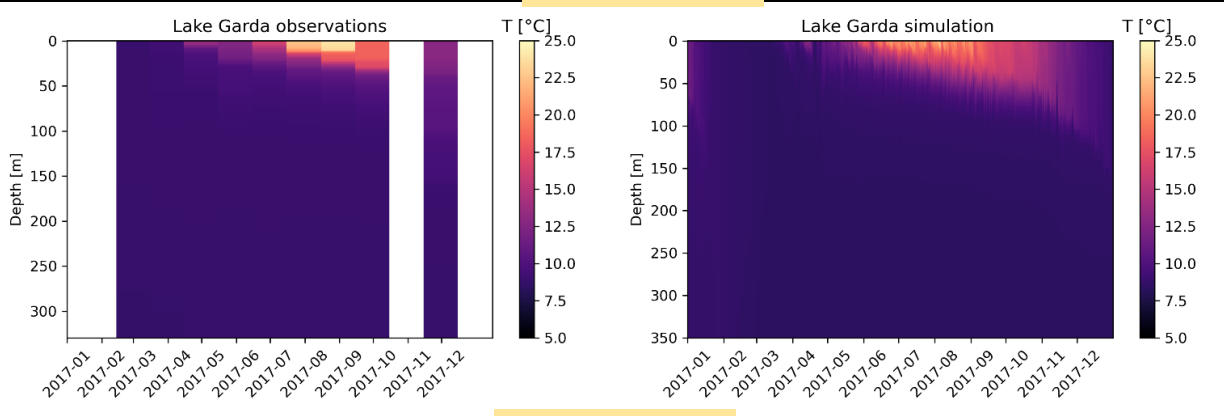
Pühringer et al., In preparation.



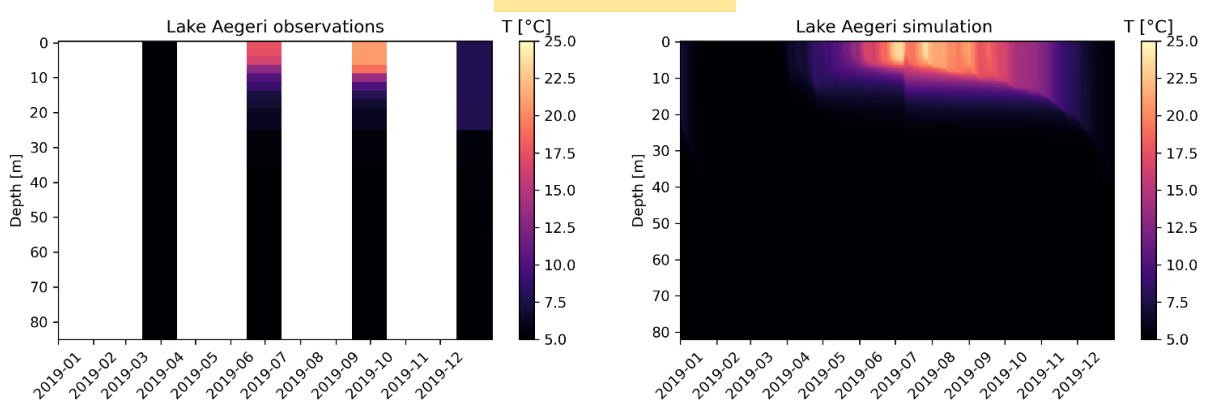
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Numerical modeling challenges: Some examples from diverse lakes

RMSD= 0.73°C

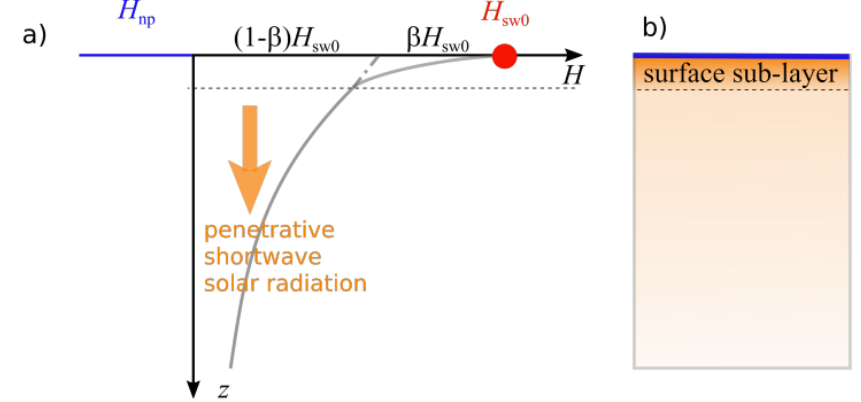


RMSD= 0.68°C

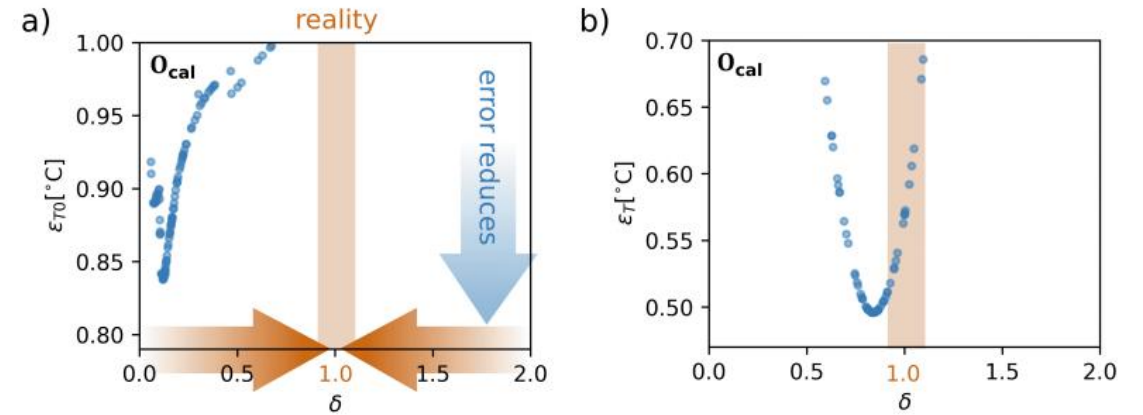


Lack of sufficient in situ data

net longwave, sensible, latent heat fluxes (non-penetrative) H_{np}
Incoming shortwave solar radiation (net of albedo) H_{sw0}



Misimplementation of numerical models



Without β implementation

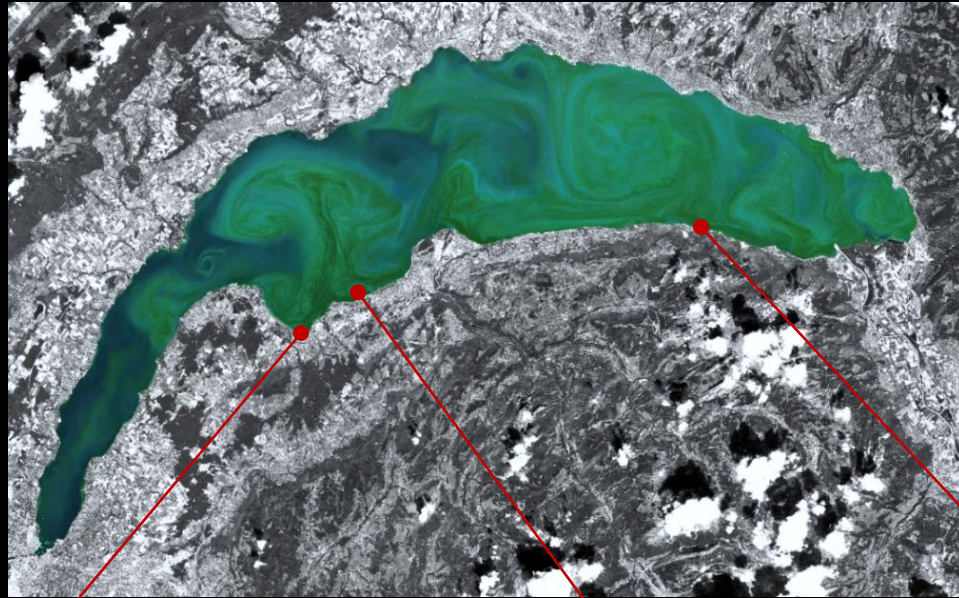
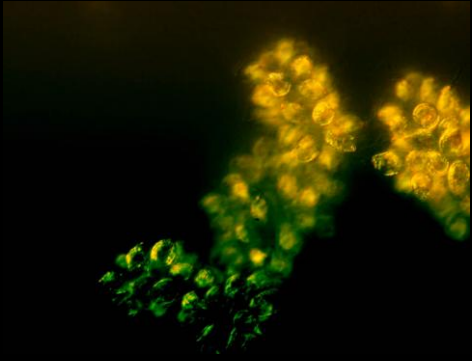
With β implementation

Amadori, M., A.I. Rahaghi, D. Bouffard, and M. Toffolon. Using automatic calibration to improve the physics behind complex numerical models: An example from a 3D lake model using Delft3d (v6.02.10) and DYNO-PODS (v1.0). 2025. *Geoscientific Model Development*. 18, 3473-3486



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Case study 1: Unprecedented Uroglena bloom in Lake Geneva

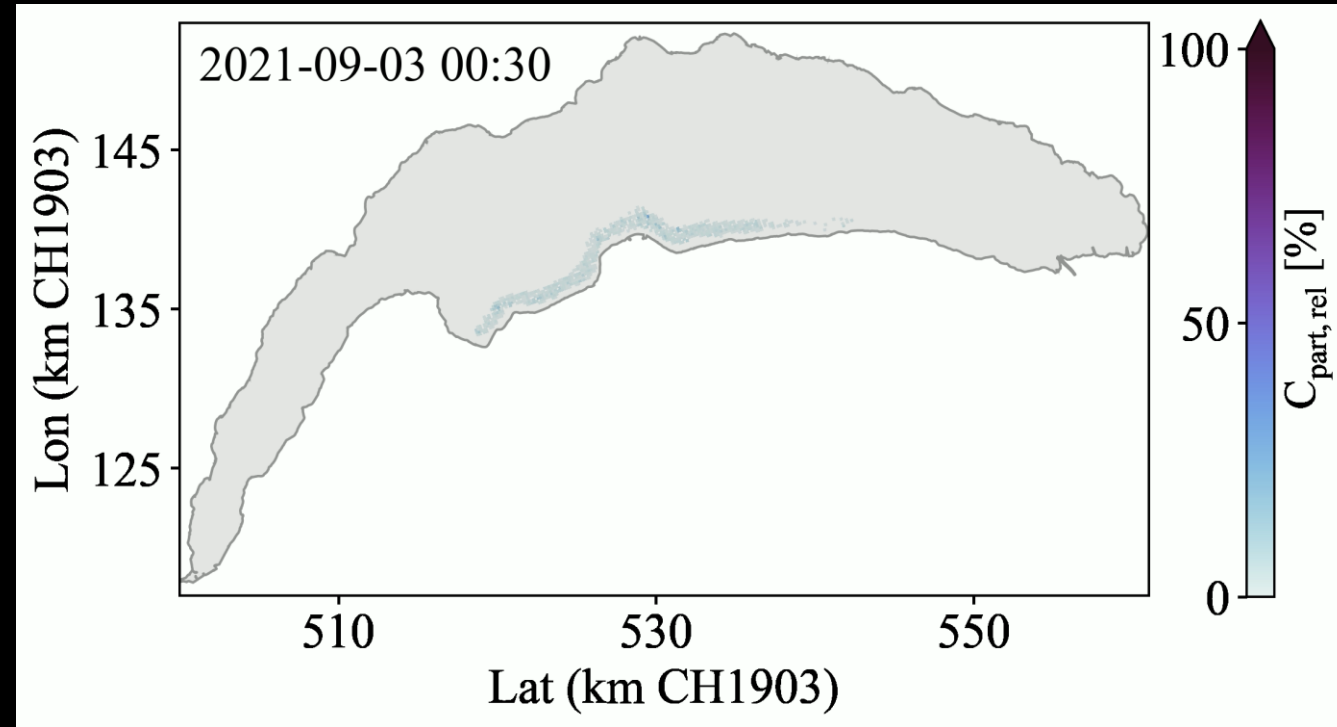
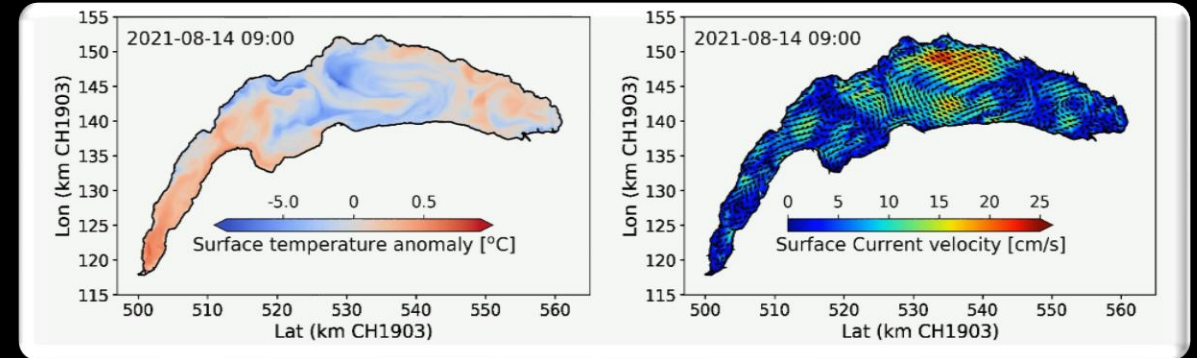
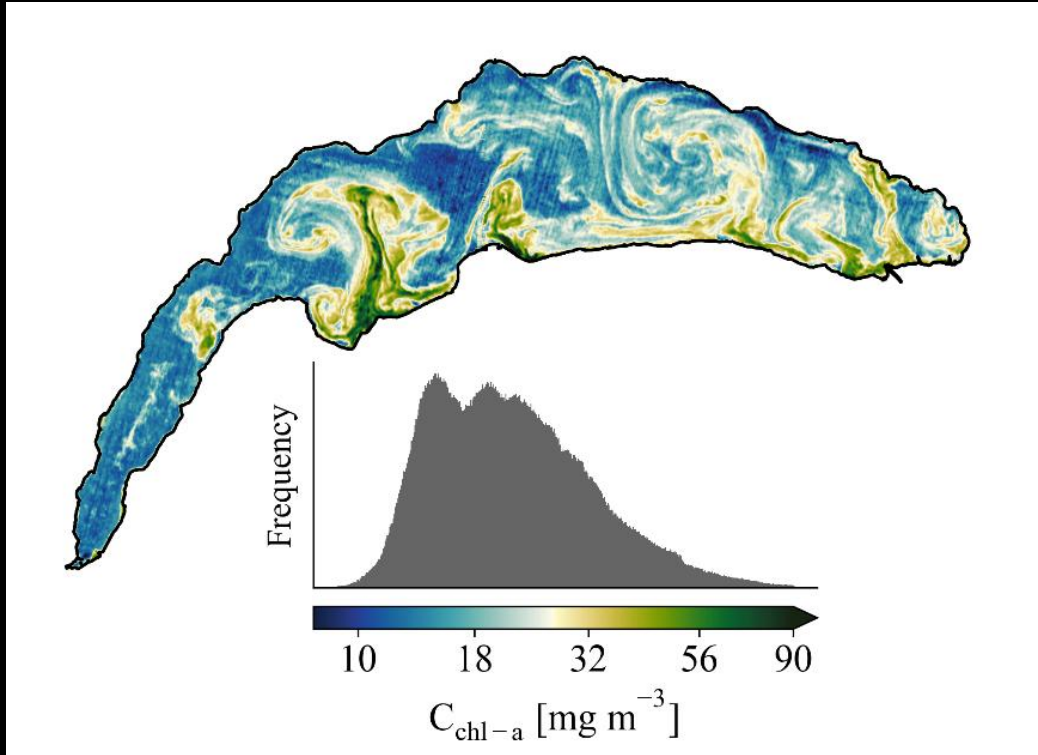


Source: www.lenouvelliste.ch

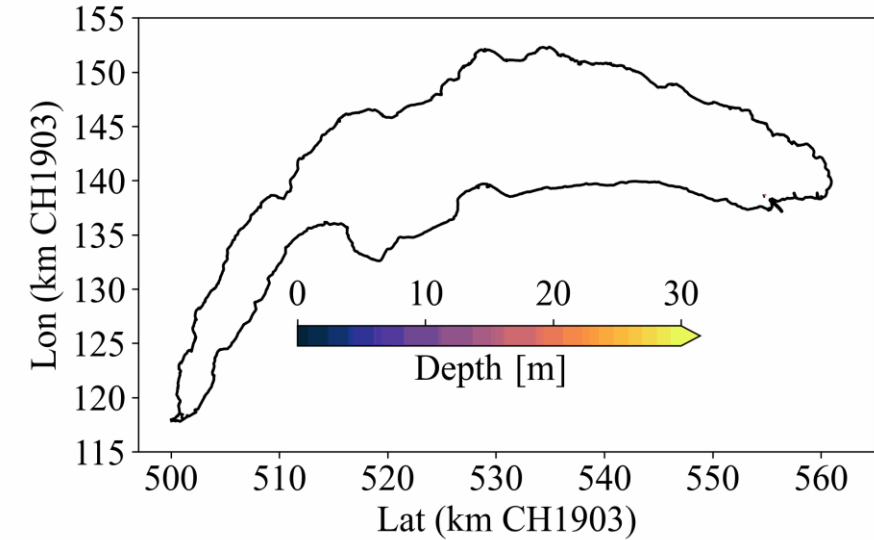
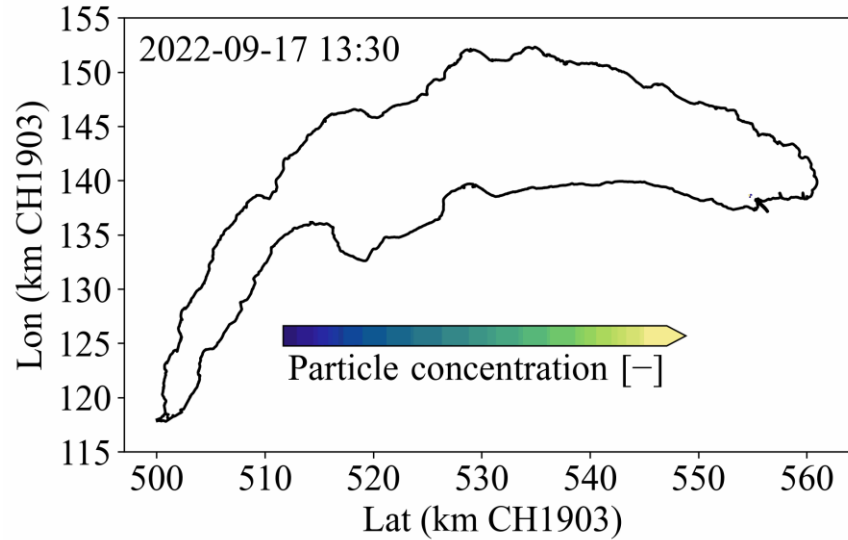
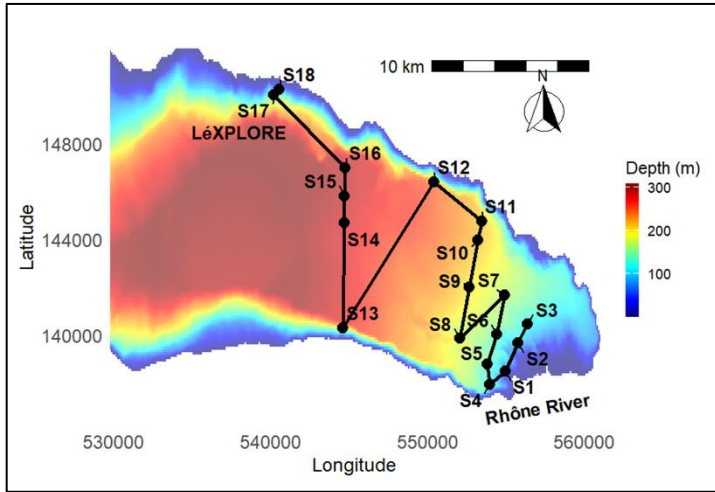
Identification : INRAE, F. Rimet, S. Rasconi H. Kochoska



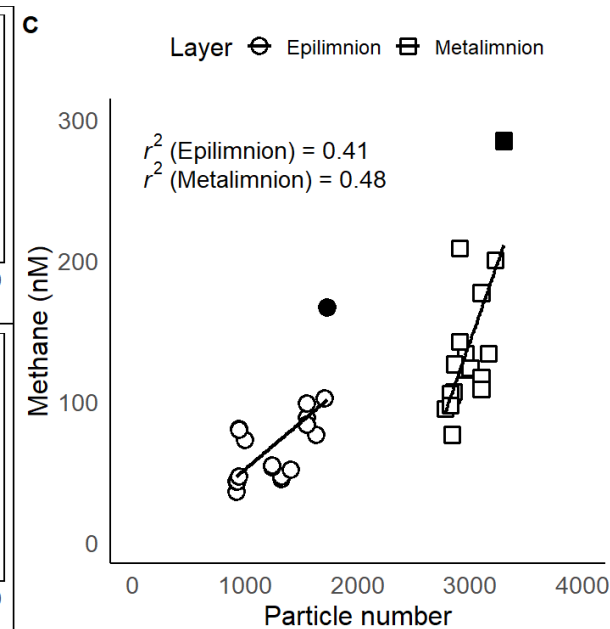
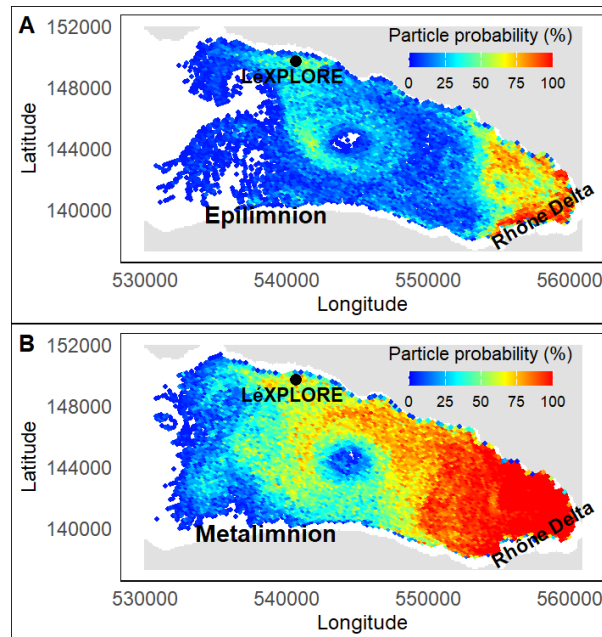
Case study 1: Unprecedented Uroglena bloom in Lake Geneva...



Case study 2: Metalimnetic methane dynamics in Lake Geneva



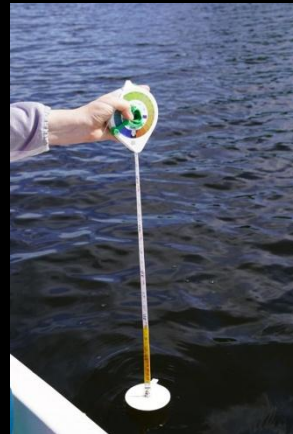
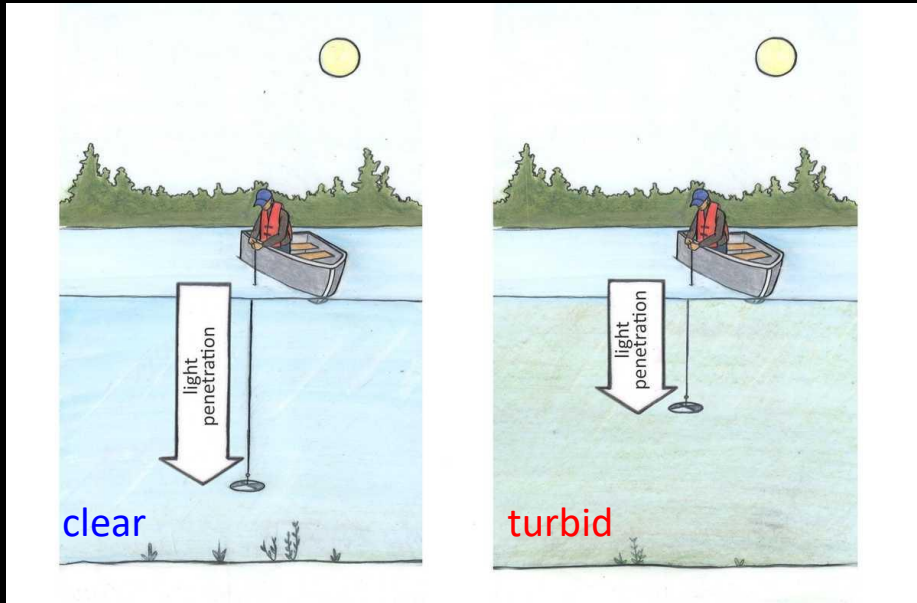
Khatun, S., R. Grilli, A.I. Rahaghi, J.S. Berg, D. Jézéquel, D. Bouffard, C.J. Schubert, J. Chappellaz, and M.-E. Perga. Tracing the origins of metalimnetic methane in a stratified temperate lake: Insights from high-resolution mapping and 3D hydrodynamic modelling. Under review in *Limnology & Oceanography Letters*.



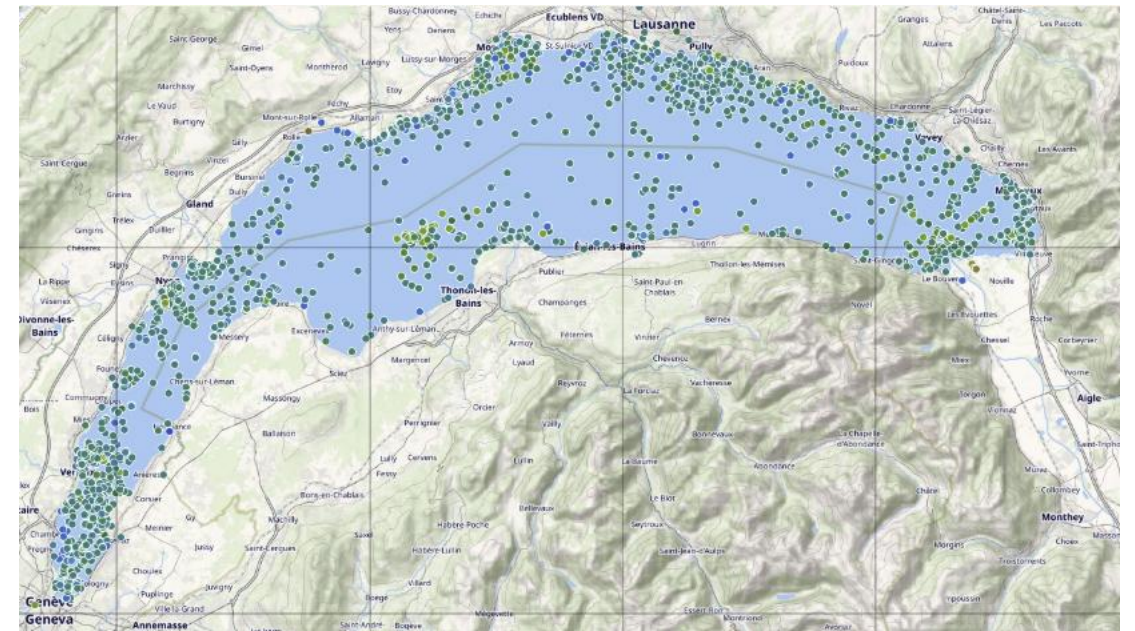
Case study 3: Lémanscope

Water clarity measurement: Secchi disk

A proxy for water quality in the surface layer

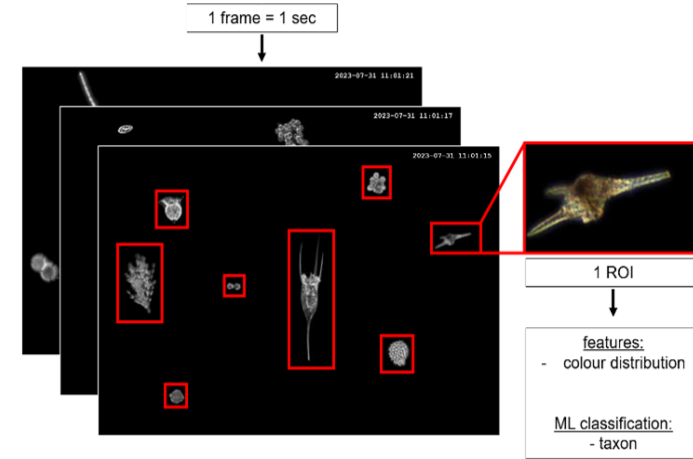
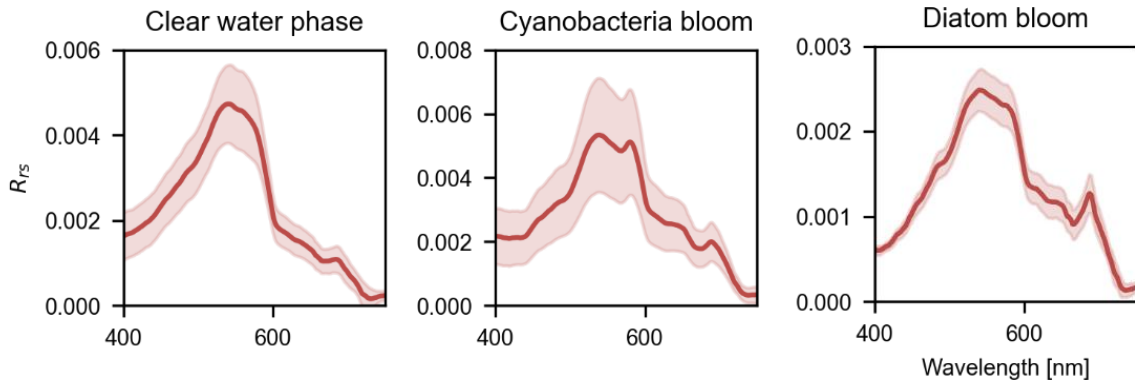


+700 volunteers, +3500 measurements in ~2 years



<https://lemanscope.org/>

Case study 4: Reflectance measurements and plankton taxa in Greifensee





Lausanne, Switzerland, Nov 2025

eawag
aquatic research ooo



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Connecting
Switzerland and
South Asia



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra



Faculty of Civil Engineering
K. N. Toosi University of Technology

Automated Real-time Monitoring Analysis Network (ARMAN): Towards Developing an Integrated Remote Sensing Platform for Inland Water Bodies in Iran

We are seeking motivated students in the
following domains for selected water bodies
in Iran:

- *Water quality remote sensing*
- *Thermal and water extend remote sensing*
- *1D numerical modelling*
- *3D numerical modelling*



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Acknowledgment

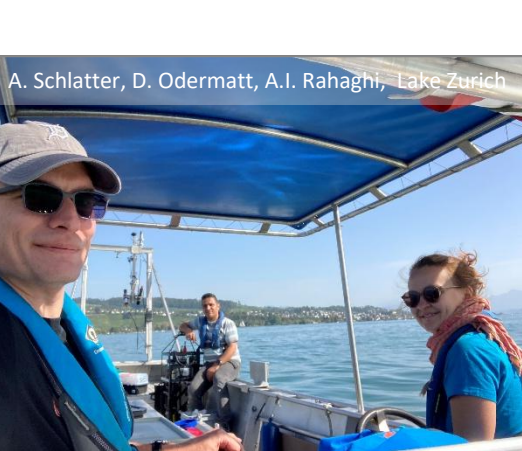
Eawag: Pascal Rünzi, Anita Schlatter, Christian Ebi, James Runnalls, Michael Plüss, Damien Bouffard, Jonas Wydler, Michael Brechbühler, Fabian Bärenbold, Michel Vittoz, Fiona Pühringer, Samuel Landolt, Reto Britt

University of Zurich: Kathrin Naegeli

EPFL: Sébastien Lavanchy, Guillaume Cunillera, Jérémy Keller

PMOD/WRC: Julian Gröbner

Thank You for Your Attention!



abolfazl.irani@eawag.ch



Speaker

**Mohammad Reza
NIKOO**

Associate Professor
Sultan Qaboos University
Oman

15 January 2025
1403 دی 26



Speaker

**Ehsan
KAZEMI**

Senior R&D Consultant
Intertek
United Kingdom

07 May 2025
1404 اردیبهشت 17



Speaker

**Davood
FARSHI**

Professor
Ostschweizer Fachhochschule
Switzerland

16 July 2025
1404 تیر 25



Speaker

**Stefano
BRIZZOLARA**

Postdoctoral Researcher
Institute of Science and Tech.
Austria

15 October 2025
1404 مهر 23



Moderator

**Mohammad Javad
OSTAD MIRZA TEHRANI**

Assistant Professor
K. N. Toosi University of Technology
Iran

14h30-15h30 (Tehran) | 11h00-12h00 (GMT) | 19h00-20h00 (Beijing)
Registration is free but required

waterwebinars.civil.kntu.ac.ir | waterwebinars@saba.kntu.ac.ir

KNTUWaterWebinars | <https://meet.kntu.ac.ir/b/rooms/r44-krm-ejd-0qw/join?lng=en>



2025 Series



Speaker

**Salar
Haghghatafshar**

Research Fellow and Lecturer
Lund University
Sweden

 03 January 2024
13 دی 1402



Speaker

**Abolfazi
Irani Rahaghi**

Post Doctoral Researcher
Eawag; University of Zurich
Switzerland

 08 May 2024
19 اردیبهشت 1403



Speaker

**Seyed Abbas
Hosseini Sadabadi**

Senior Researcher
INRS
Canada

 24 July 2024
03 مرداد 1403

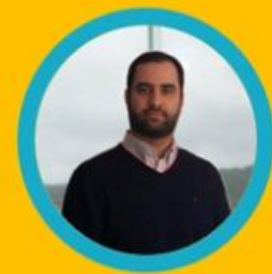


Speaker

**Farhad
Bahmanpouri**

Research Associate
CNR
Italy


 16 October 2024
25 مهر 1403



Moderator

**Mohammad Javad
Ostad Mirza Tehrani**

Assistant Professor
K. N. Toosi University
Iran

 14h30-15h30 (Tehran) | 11h00-12h00 (GMT) | 19h00-20h00 (Beijing)
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