



MIA Specialist Group

Open Group meeting at WWC&E2022

Dr Ulf Jeppsson

Chair of MIA SG, Lund University, Sweden



LUND
UNIVERSITY



inspiring change



AGENDA



- Introduction
- Group organization and composition
- Activities
 - Associated YWP initiatives
 - Task Groups and Working Groups
 - Webinars
 - Conferences
 - Others
- Call for new YWP MC members

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MIA SPECIALIST GROUP



*“This group targets people from research, consulting companies, institutions and operators to think along **the use of models and computing tools to support the understanding, management and optimization of water systems.**”*

PRIORITIES

- Stimulate interaction and knowledge transfer in the domain of modelling and integrated assessment
- Interact with other IWA SGs and other academic/professional organisations

How to find us



Website: <http://iwa-mia.org/>



<https://iwa-connect.org>

GENERAL ACTIVITIES OF MIA MC



- Spread information of the Group's activities and developments
- Convene conferences and arrange workshops/webinars
- Initiate research and case studies, produce special papers
- Stimulate initiation and host Task Groups and Working Groups
- Interact and streamline activities with other IWA SGs, as well as with other academic and professional organisations
- Start SG-internal committees on specific emerging topics of interest
- Work for the benefit of our members, assist IWA HQ on issues

ORGANISING THE WORK WITHIN MIA



- Monthly electronic MC meetings (1 hour)
- Tri-monthly focused YWP meetings + mentoring
- Open MIA SG meeting at major conferences (1/yr)
- Closed MIA MC meeting at major conferences (1/yr)
- Short newsletter (generated from IWAconnect)
- Posting news on IWA_Connect
- Manage open MIA website for non-IWA members
- Produce MIA part of the IWA Global Trend Report series
- Close collaboration with IWA HQ, IWA SC2SG and IWA Learn

ORGANISING THE WORK WITHIN MIA



- Strong focus on TGs and WGs
- Organise conferences and workshops (IWA/MIA events)
- Organise workshops or sessions at non-IWA/MIA conferences (SETAC, IFAC)
- Organise webinars
- Create MIA visibility on social medias (LinkedIn, Twitter, YouTube)
- **Create friendships**
- **Remember face-to-face social activities**

AGENDA

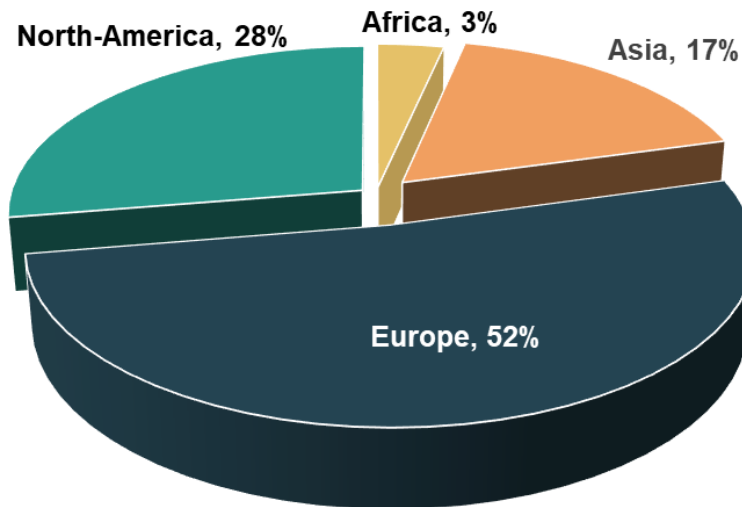


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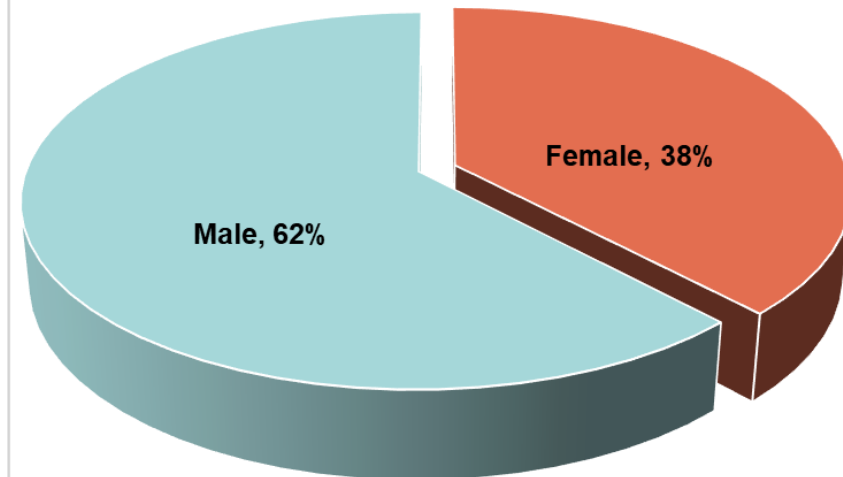
MIA MANAGEMENT COMMITTEE

- “Time is the enemy” – ALL SG WORK is VOLUNTARY!
- Dedicated MC members essential

MIA per country



MIA per gender



MIA MANAGEMENT COMMITTEE

- “Time is the enemy” – ALL SG WORK is VOLUNTARY!
- Dedicated MC members essential
- MC: 14 senior members (+ outgoing chair) & 14 **associated YWPs** working in teams

- **MC** more **ACTIVE** and **DYNAMIC**
- Higher work **CAPACITY**
- Create **OPPORTUNITIES** for YWPs

Across
12 Countries
21 Institutions



PHILOSOPHY ASSOCIATED YWPs



Active program to fully engage, mentor and involve YWPs

- Every “full” MC member teamed up with associated YWP
- Teams made up from different research groups
- Senior MC members take on mentoring role
 - Train YWPs in leadership
 - Actively involve them in MC activities
- Associated YWPs can grow into full members if place opens up
- This innovative approach has now been adopted by many other SGs

MANAGEMENT COMMITTEE

Associated YWPs

<input type="checkbox"/> Lluís Corominas	(Webinar Coordinator)	Feiyi Li
<input type="checkbox"/> Bruce Johnson	(Industrial Insight Officer)	Arifur Rahman
<input type="checkbox"/> Kimberly Solon	(Administrative Coordinator)	Fanlin Meng
<input type="checkbox"/> Giacomo Bellandi	(TG and WG Coordinator)	Fabio Polese
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<input type="checkbox"/> Ingmar Nopens	(Outgoing chair)	



Ulf Jeppsson
(Chair)

IEA, Lund University, Sweden

Associated YWP:
Saba Daneshgar



Elena Torfs
(Vice chair)

BIOMATH, UGent, Belgium

Associated YWP:
Tri Le

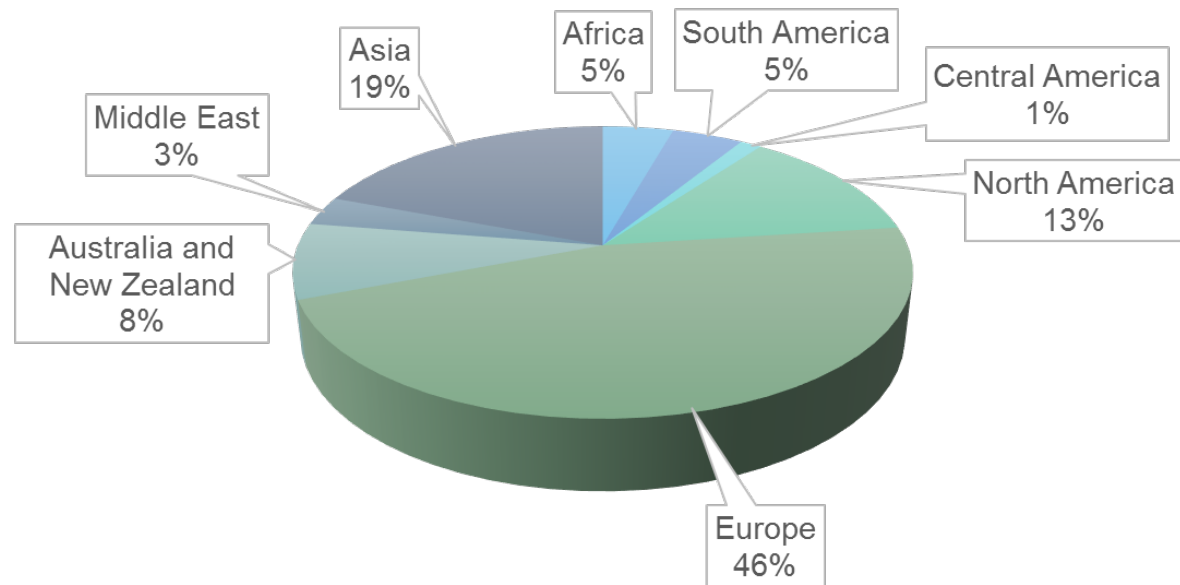
THANKS TO OUTGOING MIA MC MEMBERS



- Domenico Santoro
- Patrick Adadzi
- Cristina Martin
- Jing Chris Sun (YWP)
- En Shi (YWP)
- Xueming Chen (YWP)

MIA GROUP MEMBERS

- 1918 members (according to IWAconnect, Sept. 6, 2022)



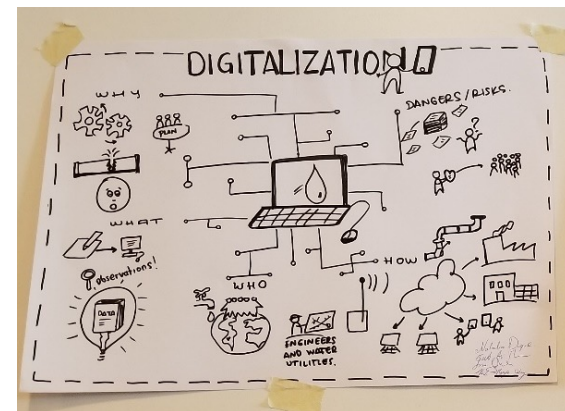
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INITIATIVES OF ASSOCIATED YWPs

- TG/WG liaisons: YWPs form direct link between MC and TG/WGs
- 3-monthly separate YWP meeting discussing ongoing activities and new initiatives + mentoring
- (Co-)organization of workshops
 - Integrated modelling workshop at YWP conference Toronto
 - YWP workshop at Watermatex 2019
 - YWP workshop at WRRmod2021 and WRRmod2022+



INITIATIVES OF ASSOCIATED YWPs



■ MIA INTERNAL YWP SEMINARS

- To present their background, current research and seek an opportunity for potential collaboration

■ MIA SG NEWSLETTER

- Newsletter for MIA members once in 3 months through IWA-connect

■ SUPPORTING LOCAL YWP CHAPTERS



■ YWP SEMINARS OPEN TO ALL YWPs

- Seminars are being planned in the field of MIA and networking event



■ NETWORKING EVENTS WITH IWA SPECIALIST GROUPS YWPs

- In planning phase

TASK GROUPS AND WORKING GROUPS



- MIA has a strong focus on TGs and WGs
- YWP liaisons to all TGs and WGs
- Request on our TGs: report on progress, update website etc
- Dedicated IWAconnect subpages for each TG and WG

TASK GROUPS AND WORKING GROUPS

Task Groups (TGs)

- Benchmarking of Control Strategies for WWTPs (BSM) and Good Modelling Practice (GMP) (**Finished**)
- Design and Operations Uncertainty (DOUT), chair Lina Belia – Liaison Christoffer Wärrf (**Finished**)
- Generalised Physico-Chemical Modelling (PCM), chair Damien Batstone – Liaison Kimberly Solon (**Finishing**)
- Use of Modelling for Minimizing GHG Emissions from Wastewater Systems (GHG), chair Jose Porro – Liaison xxx (**Finished**)
- Membrane Bioreactor Modelling and Control, chair Giorgio Mannina – Liaison xxx
- Good Modelling Practice in Water Resource Recovery Systems, chair Patrick Dunlap – Liaison Kimberly Solon

Working Groups (WGs)

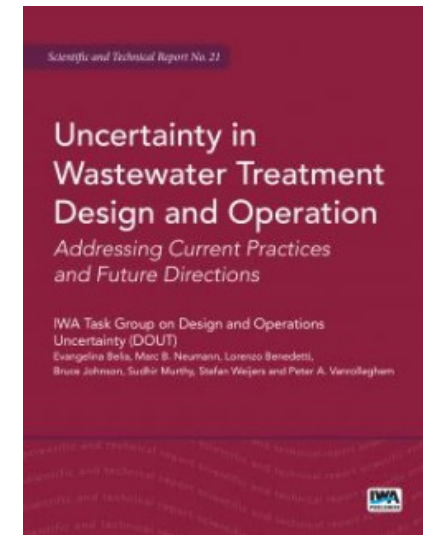
- Integrated Urban Water Systems (IUWS), chair Peter Bach – Liaison Sovanna Tik
- Computational Fluid Dynamics (CFD), chair Julien Laurent – Liaison Gamze Kirim
- Life Cycle Analysis (LCA), chair Lluís Corominas – (**Finished**)
- Good Modelling Practice (GMP), chair Günter Langergraber – Liaison xxx
- Hybrid Modelling Working Group (HMWG), chair Sina Borzooei – Liaison xxx (**New**)

IDEAS for NEW TGs or WGs?

TG: Design and Operations Uncertainty

(**Chair:** Lina Belia – **Liaison:** Christoffer Wärrff)

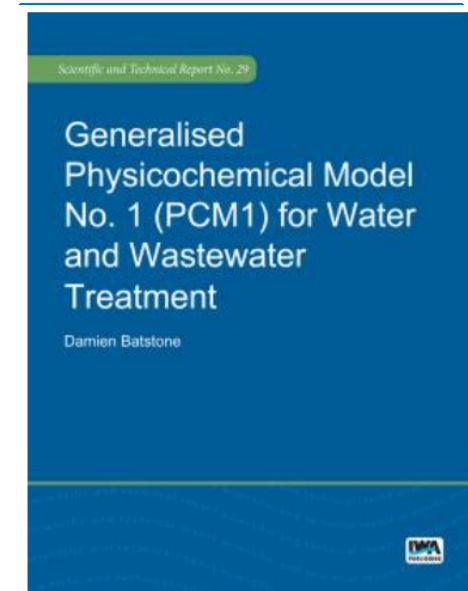
- **Goals:**
 - Increase efficacy and transparency of wastewater infrastructure (design/operations) via the use of numerical simulation with statistical analysis
- **Activities**
 - Workshop during Watermatex 2019
 - Webinar February 6, 2018
 - STR published late 2021



TG: Generalized Physicochemical Framework

(**Chair:** Damien Batstone – **Liaison:** Kimberly Solon)

- **Goals:**
 - Develop a physicochemical framework with high predictive capacity that is usable across the range of unit operations by both modelers and end-users
- **Activities:**
 - STR in final review process. Publication foreseen in fall 2022 (**in press**)



TG: Modelling of GHG emissions

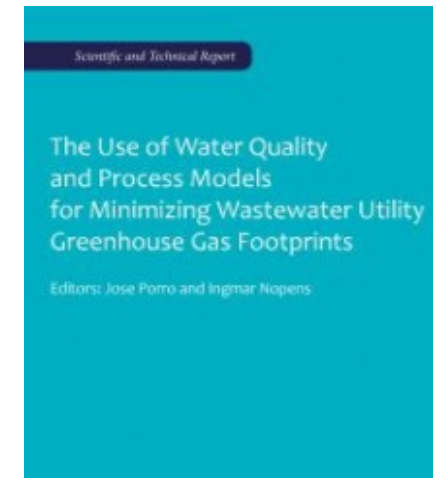
(Chair: Jose Porro – Liaison: xxx)

■ Goals:

- Understand the processes that are responsible for the major contributions to GHG emissions from WWTPs and sewer systems
- Translate this knowledge into mathematical models

■ Activities:

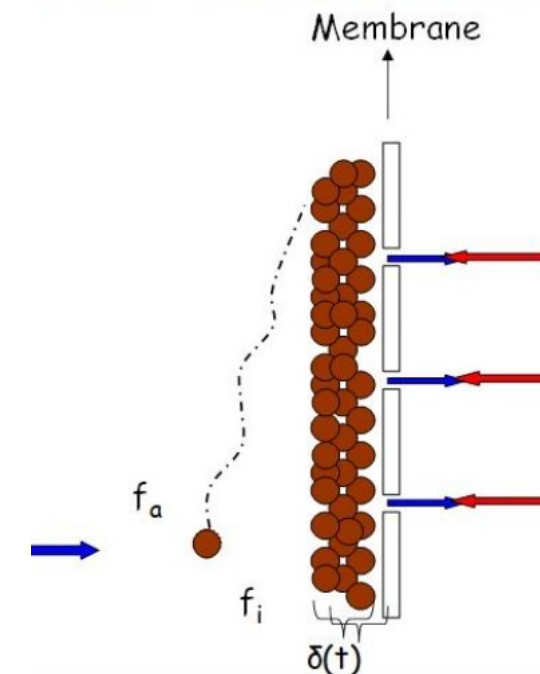
- Development of an N₂O Field Measurements Guide
- Open webinar on Sept. 21, 2021
- STR published in 2022, **open access**



TG: MBR modelling and control

(Chair: Giorgio Mannina – Liaison: xxx)

- Goals:
 - Propose standardized criteria to integrate biological, filtration and energy models for modelling of MBR-based systems.
 - Set-up a database that can be used for plant-wide modelling, control and optimization of MBR-based systems.
- Activities
 - Workshops during UDM 2018, Watermatex 2019 and WRRmod2021
 - Special session during 9th IWA-MTC conference 2019



TG: Good Modelling Practice in Water Resource Recovery Systems



(Chair: Patrick Dunlap – Liaison: Kimberly Solon)

- Goals:
 - Evaluate the adoption of the previous STR.
 - Assess the state of WRRF modelling practice (broadening the focus of the first GMP Task Group, e.g., focus on plant-wide modelling)
 - Provide practitioners with updated and extended guidance to meet new challenges of the industry (e.g., from wastewater treatment to resource recovery systems).
- Activities
 - Start of preparation of STR (review, update, development of new chapters)

WG: Integrated Urban Water Systems

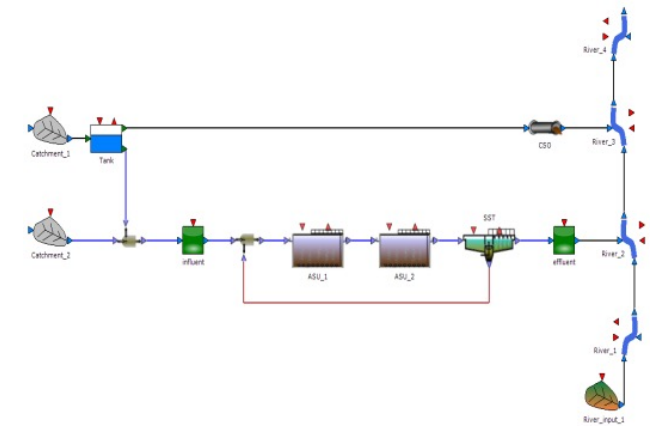
(Chair: Peter Bach – Liaison: Sovanna Tik)

■ Goals:

- Integration of models of all components of the water cycle in urban areas including the nutrients and energy cycles

■ Activities:

- Creation of an IWA *WaterWiki* group and a LinkedIn Group for dissemination
- Webinar September 26, 2017
- Organization of workshops in Watermatex2015, Urban Drainage 2015, YWP Conference 2019, WRRmod2021
- *Upcoming:* White paper on barriers to integrated modelling



IWA MIUWS Working Group

[MENU](#)

About MIUWS

[Home](#) » [About MIUWS](#)

Both policy makers and industry are increasingly realizing the necessity to adopt an integrated approach to water management. In Europe, this is clearly stated in the Water Framework Directive, and by the recent funding of large research projects on that topic (e.g. PREPARED, SANITAS, TRUST). In North America, recent activities confirm this direction, e.g. the USEPA's Integrated Planning and Permitting Initiative and integrated planning framework, two new WERF Research Challenges: "Linking Contaminant Sources to Receiving Water Impacts" and "Sustainable Integrated Water Management". Other areas in the world are already following closely. IWA has launched the "Cities of the Future" programme, which has strong integration components.

Website:

<http://miuws.org/index.php/sample-page/>

WG: Computational Fluid Dynamics

(Chair: Julien Laurent – Liaison: Gamze Kirim)

- Goals:
 - Develop guidance documents and hands-on training for good modelling practice in CFD for wastewater treatment modelling
 - Consensus building on state-of-the-art knowledge gaps and future needs
- Activities:
 - Workshop during Watermatex2019, WRRmod2018 and WEFTEC 2017
 - Webinar February 5, 2019
 - Scientific and technical report published in 2022, **open access**
 - Position paper in preparation



Scientific and Technical Report Series No. 30

CFD Modelling for Wastewater Treatment Processes

IWA Working Group on Computational Fluid Dynamics

Edited by Julien Laurent, Randal Samstag,
Jim Wicks and Ingmar Nopens

WG: Life Cycle Analysis

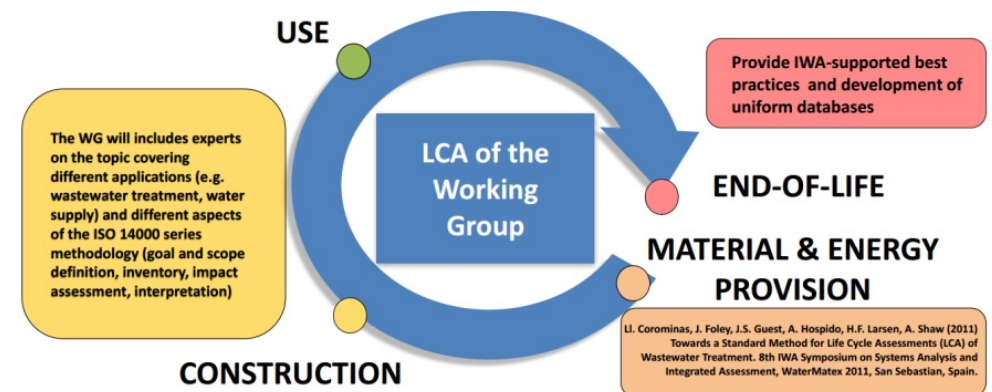
(Chair: Lluís Corominas – Liaison: xxx)

■ Goals:

- To facilitate the exchange of ideas and develop consensual methodologies, in order to promote better use of LCA in the urban water systems

□ Activities:

- Workshop during Watermatex 2019
- Published white paper on “Life cycle assessment applied to wastewater treatment: An operational guide”
- **Finished**



WG: Good Modelling Practice

(Chair: Günter Langergraber – Liaison: xxx)

■ Goals:

- Create a new Task Group on Good Modelling Practice with a wider perspective (outside AS system)
- Recruit members for such a TG and transfer knowledge
- Continue to provide courses etc. on Good Modelling Practice

□ Activities:

- Goals achieved

WG: Hybrid Modelling (NEW)

(Chair: Sina Borzooei – Liaison: xxx)

■ Goals:

- To disseminate the latest work on application of HM in water sector
- Investigate and harmonise terminology
- Facilitate exchange of early ideas and experiences
- Identify gaps in current knowledge and practices
- Create an open-source platform with a Git repository
- Develop a test case study of HM and openly shared data

□ Activities:

- HM workshop at WRRmod2021 and at WWC&E2022
- Review article published in WST
- Webinar November 10, 2020
- **Formally initiated in August 2022**

MIA WEBINARS VIA IWA_LEARN



1. **Overcoming data issues and barriers to integrated modelling in practice**
– September 26, 2017 – 225 registered attendees
2. **Modelling resource recovery: State-of-the-art and future challenges** –
February 6, 2018 – 461 registered attendees (an IWA record at the time)
3. **New advanced in advanced biological phosphorous removal** – July 9,
2018 – 250 registered attendees
4. **Computational Fluid Dynamics: Applications and good modelling
practice** – February 5, 2019 – 380 registered attendees
5. ***Wastewater Disinfection Modelling*** – October 24, 2019 – (392 attendees)
6. ***Advanced Oxidation Process Modelling*** – November 14, 2019 (452
attendees)
7. ***Hybrid Models in Wastewater: Merging mechanistic with data-driven*** –
November 10, 2020 (419 attendees)

MIA WEBINARS BY MIA SG



8. **Advancements on N₂O modelling in water resource recovery facilities** – September 21, 2021 – approx. 100 attendees (also YouTube)
9. **Modelling wastewater treatment resilience for improved decision making and resource recovery**– October 21, 2021 – approx. 100 attendees (also YouTube)
10. **State-of-the-art in anaerobic digestion modelling** – November 22, 2021 – approx. 100 attendees (also YouTube)
11. **State-of-the-art modelling on anaerobic mixed-culture fermentation** – March 31, 2022 – approx. 100 attendees (also YouTube)
12. ***The incorporation of risk and uncertainty in mathematical models to aid the design and operations of WRRFs*** – June 8, 2022 – approx. 100 attendees (also YouTube)

MIA UPCOMING WEBINARS (TENTATIVE)



13. Generalized physico-chemical modelling – October 2022

14. Green-house gas modelling – November 2022

15. Sewer modelling – December 2022

16. MBR modelling – early 2023

JOIN US TO CONTRIBUTE TO WEBINARS WITH YOUR IDEAS



- You are invited: workshop organizers, speakers, expertise...
- Any topics related to water modelling, simulation, optimization...
- Collaborate with us webinars@iwa-mia.org for your webinar proposal

UPCOMING CONFERENCES

8th Water Resource Recovery Modelling seminar (WRRmod2022+)

- Location: Stellenbosch, South Africa, 18-21 January 2023
- Chair: Dr. David Ikumi (Univ. Cape Town)



11th Symposium on Modelling and Integrated Assessment (Watermatex2023)

- Location: Québec City, Canada, late summer 2023
- Chair/vice-chair: Prof. Peter Vanrolleghem (Univ. Laval)/Prof. Elena Torfs (Univ. Ghent)



9th Water Resource Recovery Modelling seminar (WRRmod2024), Stowe, Vermont, USA?

PROCEEDINGS ON IWA_CONNECT



Publications

- [WRRmod2021, Virtual](#)
- [WRRmod2018, Québec, Canada](#)
- [WWTmod2016, Annecy, France](#)
- [WWTmod2014, Spa, Belgium](#)
- [WWTmod2012, Québec, Canada](#)
- [WWTmod2010, Québec, Canada](#)
- [WWTmod2008, Québec, Canada](#)

- [Watermatex2019, Copenhagen, Denmark](#)
- [Watermatex2015, Queensland, Australia](#)
- [Watermatex2011, San Sebastian, Spain](#)
- [Watermatex2007, Washington DC, USA](#)
- [Watermatex2004, Beijing, China](#)
- [Watermatex2000, Ghent, Belgium](#)

[ICA2017, Québec, Canada](#)
[ICA2013, Narbonne, France](#)
[ICA2009, Cairns, Australia](#)
[ICA2001, Malmö, Sweden](#)

[FICWTM2017, Palermo, Italy](#)

[AutMoNet2007, Ghent, Belgium](#)
[AutMoNet2004, Vienna, Austria](#)
[AutMoNet2002, Vienna, Austria](#)

[IT&Water2012, Amsterdam, The Netherlands](#)

OTHER

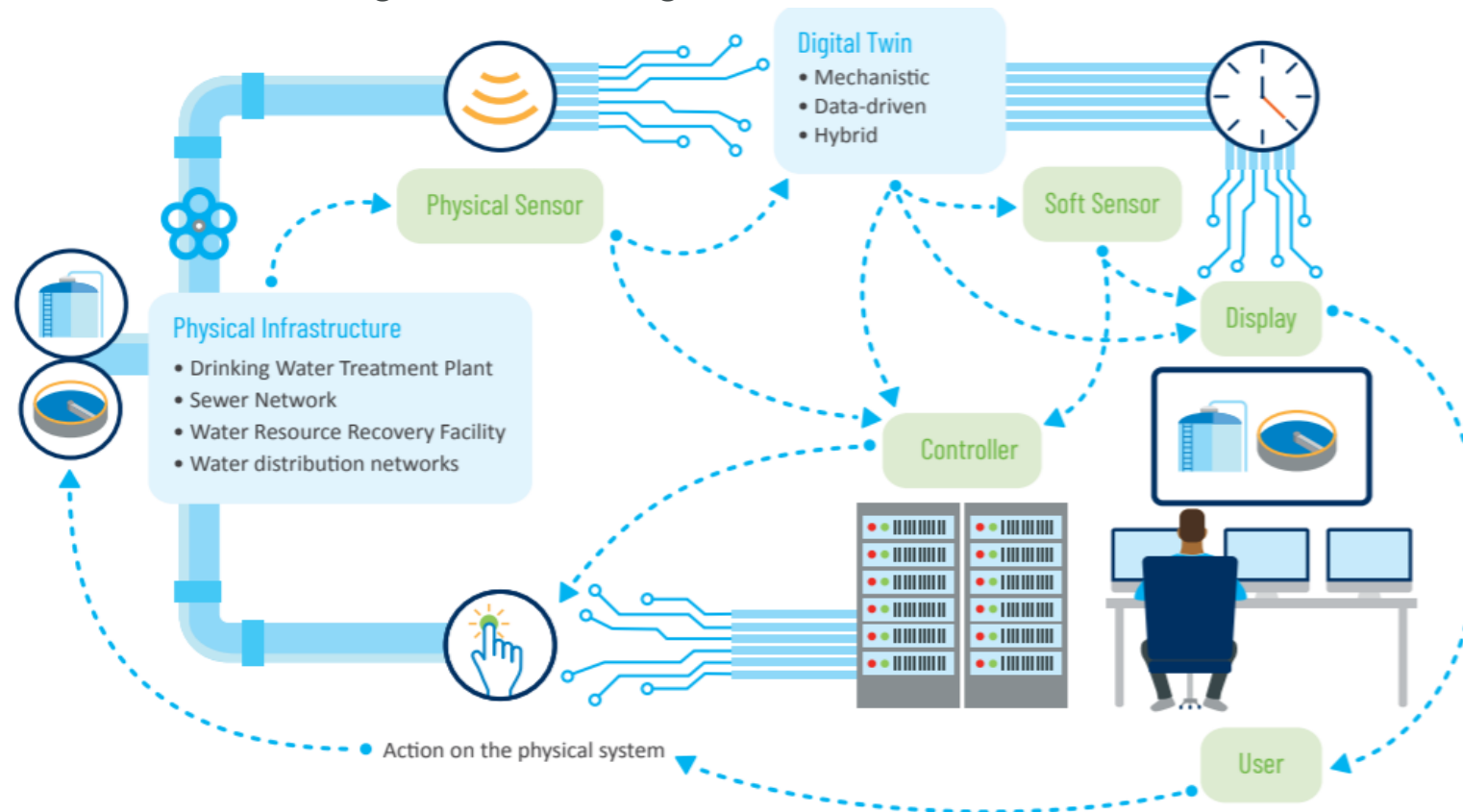


- Steering committee member to [IWA digital water program](#) (Saba Daneshgar)
- IWA Global Trend Report **2022**: Emerging Topics in Modelling and Integrated Assessment
- Yearly summary of MIA activities on our web sites

WHITE PAPER

■ DIGITAL WATER: OPERATIONAL DIGITAL TWINS IN THE URBAN WATER SECTOR

— Part of the IWA Digital Water Programme



- <https://iwa-network.org/publications/operational-digital-twins-in-the-urban-water-sector-case-studies/>

PUBLISHED ARTICLE ON WRRF's OPERATIONAL CHALLENGES DURING COVID-19



▪ MIA SG MC MEMBERS – TEAM WORK

- Published a perspective article in *Water Environment Research*
- A collaboration between YWPs & EWPs within the MIA SG MC members

▪ HIGHLIGHTS OF THE ARTICLE

- Focuses on WRRFs operational challenges during COVID-19
- Benefits of automation & digitalization for WRRF operations during pandemic
- Highlights emergency responses, resiliency & mitigation strategies

YWP COAUTHORS



Arifur Rahman



Gamze Kirim



Mahmudul Hasan



Sina Borzooei

EW P COAUTHORS



Evangelia Belia



Domenico Santoro



Bruce Johnson

Wiley Online Library



PERSPECTIVE | Free Access

Digital solutions for continued operation of WRRFs during pandemics and other interruptions

Arifur Rahman Evangelia Belia, Gamze Kirim, Mahmudul Hasan, Sina Borzooei, Domenico Santoro, Bruce Johnson

First published: 28 July 2021 | <https://doi.org/10.1002/wer.1615>

<https://onlinelibrary.wiley.com/doi/abs/10.1002/wer.1615>

SOCIAL MEDIA



Follow the Modelling and Integrated Assessment Specialist Group on



<https://iwa-connect.org/group/modelling-and-integrated-assessment-mia/timeline>



<https://www.linkedin.com/company/iwa-mia-specialist-group-on-modelling-and-integrated-assessment>



IWA MIA Specialist Group
92 subscribers

MIA SG open website

<http://iwa-mia.org>



https://twitter.com/iwa_mia_sg

To get informed about our latest events, opportunities, publications, webinar recordings and news!

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BIOMATH, UGent, Belgium

Associated YWP:
Tri Le

CALL FOR NEW YWP MC MEMBERS



- Call for applications will soon be open!
 - Associated YWP members
- Application: [Instructions](#) soon on IWAconnect and social media
- Selection: Electronic voting by senior MC members

FINAL REMARKS



- These slides will be available on IWAconnect (MIA) and MIA open web site
- The recording of this meeting will be made available on the MIA YouTube channel
- The next MIA Open Group meeting will be at Watermatex 2023 (Québec, Canada, late summer 2023)



for your attention!

Questions and comments!