Health Related Water Microbiology Specialist Group Issue 17 – April 2018

In this issue

HRWM Updates

Dear HRWM members

It has been a busy last few years....., and an incredibly hectic few months before our conference at Chapel Hill. I cannot name every person I worked with this last few months, but suffice it to say that all these folks have won my respect, the hard way! Way to go, mah peepo! (as they say in Liberia).

It has been a privilege to lead the Health-Related Water Microbiology Specialist Group. I will sit on the sidelines now, but will be pushing (and dragging) other members to become more active in our group. What we put in in terms of individual effort, we get back multiplied many-fold in terms of individual satisfaction. May the (Health-Related Microbiology) Force be with You!

Gary A. Toranzos, Ph.D.

HRWM Past Chair

It is with great honour that I lead this specialist group. I am happy to promote our group's activities.

It is a very important time for our group. Over the past 2 decades, molecular techniques have expanded, became somehow routinely used, yet still faces a lot of technical difficulties. Quantitative Microbial Risk Assessment has been developed and improved, and has become an important tool for policy makers and regulators. Microbial Source tracking is also an expanding area applied to many new challenges globally. I am excited to see the advances and usefulness of our group's field of research, and where interaction of those issues are important and therefore we, the HRWM group members, have to contribute to the society as the experts of this important field.

I'm hoping to see many of you later this year at the IWA World Water Congress and Exhibition in Tokyo, and my wish is for most of you to join me at WaterMicro in Vienna next year.

Hiro Katayama

HRWM Chair

Photo credit: Tom Fuldner

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Award Winner of Clarke Prize 2017 – one of our very own

Charles N. Haas of Drexel University received the 2017 Clarke Prize Award The National Water Research Institute (NWRI) announced that Charles N. Haas, Ph.D., received the NWRI Athalie Richardson Irvine Clarke Prize for pioneering and applying methods to assess and minimize health risks caused by exposure to disease-causing microorganisms (referred to as pathogens) in water and wastewater. http://www.clarkeprize.com/recipient.html

Summary of WaterMicro 2017, Chapel Hill

Article credit: Daisuko Sano

The 19th International Symposium on Health-Related Water Microbiology (May 15-19, Conference Chair: Prof. Mark Sobsey) was held at the University of North Carolina Chapel Hill. The symposium was concurrently organized with the UNC Water Microbiology Conference. The Conferences blended interactive workshops with scientific symposia and poster sessions, offering participants a variety of opportunities to exchange ideas, debate challenging topics and explore potential collaborations. The focus was on water microbiology from watershed to human exposure including current concerns in recreational waters, shellfish harvesting waters, emerging technologies and innovative analytical methods.

More than 300 participants joined the symposium. There were 59 oral presentations in 14 sessions, including Quantitative Microbial Risk Assessment, Recreational Water, Waterborne Pathogens, Agriculture, Outbreaks, Reuse, Bacterial Pathogens, Viral Inactivation, and Virus Dynamics. Also, there were 108 poster presentations. There were three Plenary Keynote Speeches. Dr. Stephen A. Morse (CDC, USA) gave a comprehensive talk about microbial water safety and national security (title: Emerging Pathogens and Water Safety Implications for National Security). Dr. Ana Maria de Roda Husman (RIVM, Netherlands) provided with a front-line topic about antimicrobial resistance and WaSH program (title: Towards a Global Perspective on Antimicrobial Resistance (AMR) and WaSH). Dr. Rosina Girones (University of Barcelona, Spain) introduced cutting-edge technologies in water virology (title: The Study of Viral Contamination of Water in the Metagenomics Era).

A panel discussion on the topic of Communicating Research and Evidence in the Clickbait Era (Coordinator: Dr. Jill Stewart, UNC Chapel Hill) took place on May 18th with the following three panellists: Layla Dowdy (UNC Office of Research Communications), Brian Southwell (RTI International), and Sarah Yelton (UNC Institute for the Environment).

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Grabow Award Winner 2017

The awardee of IWA-HRWM Grabow Young Investigator Award, generously sponsored by IDEXX, is Dolores Gutiérrez-Cacciabue, National University of Salta, Argentina. This award is initiated to support and encourage young scientists, especially those from developing countries, who are doing outstanding research in the field of health-related water microbiology.

Travel bursaries

The recipients of the travel bursaries were Luyanda Ndlela (South Africa), Lucia Chavez Diaz (Argentina), Veridiana Bastos (Brazil), Isaac Dennis Amoah (South Africa), and Andrea Catherine Sánchez Alfonso (Colombia).

Best Oral and Poster Presentations

The Presentation Award was presented to Emilie Bédard (Polytechnique Montréal, Canada), who gave a talk entitled "Do Electronic Faucets Cause Pseudomonas aeruginosa Outbreaks in Hospital Environments? A Review." The Poster Award was given to Emily Crossette (University of Michigan, USA), who presented her work entitled "Quantitative Metagenomic Approach for Classifying Environmental Reservoirs of Antimicrobial Resistance."

Summary of WaterMicro 2017, Chapel Hill (continued)

On the last day of the conference, May 19th, a HRWM-WHO Workshop, "The microbiological quality of recycled water and how to define minimum water quality requirements" was organized with presentations on microbial hazards and approaches for defining minimum quality requirements for water reuse; practical experiences on recycled water in different countries were also exchanged followed by a panel discussion.

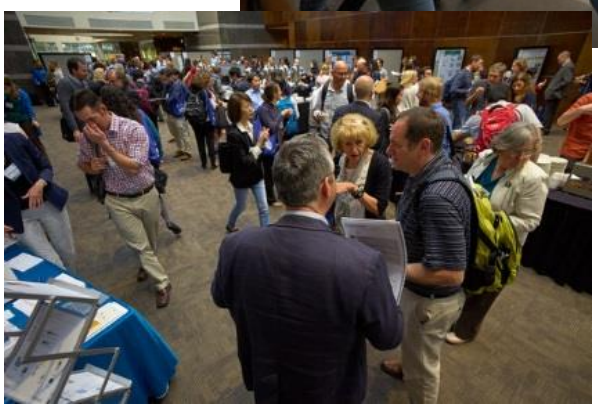


Photo credit: Tom Fuldner

8th International Young Water Professionals Conference 2017- Cape Town, South Africa

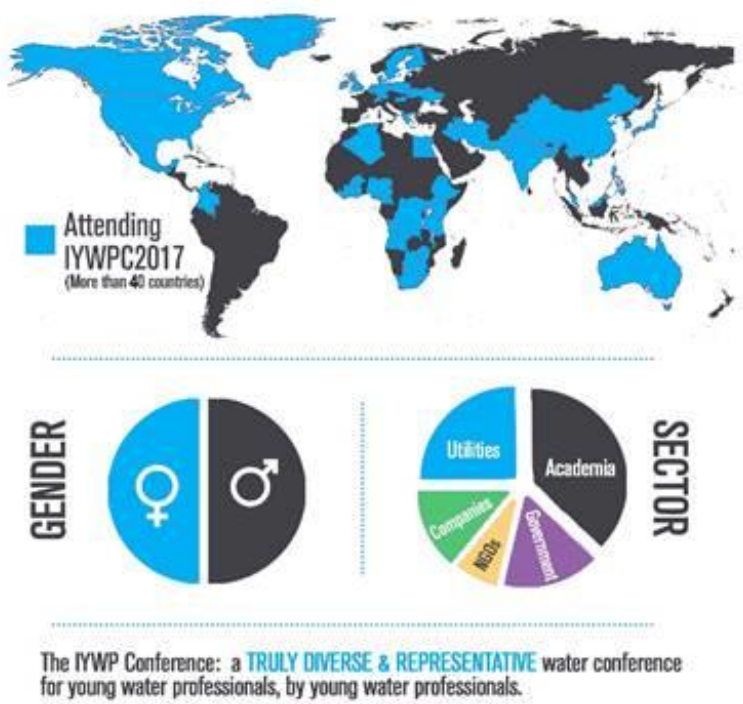
Article credit: Kirsten de Vette

The world is poised at a moment of significant opportunity to ensure a sustainable water future. The new global framework for sustainable development, the Sustainable Development Goals, places water at the centre of that future and presents an unprecedented opportunity for the water sector to deliver it. To do so by the SDGs deadline of 2030 will need a massive effort. Discussions so far have mainly focused on financial needs, and who will pay. Success will require major investments, but also new policies, regulations and institutions, new infrastructure and technologies. Perhaps more than anything, it will require people – newly trained, or retrained, professionals to govern, manage and deliver water-related services.

This includes ensuring a new generation of water professionals are trained and educated to have the appropriate skills needed to deliver this vision in their own countries. The IWA International Young Water Professionals Conference is the leading global event bringing together young water leaders from around the world. The event provides a platform to debate the challenges and solutions facing the sector and the role of young professionals within it. It offers learning and professional development opportunities; and enables networking amongst young professionals.

In it's eighth year, the 2017 event welcomed 320 delegates from across over 40 countries, a 28% increase in delegates, reflecting a truly diverse and multidisciplinary conference. It may also have been one of the most gender balanced water conferences anywhere in the world, with close to a 50/50 split. Delegates participated in a programme with 3 parallel streams and a full programme of professional Development:

- Pre-conference networking activity in the field – the Water Hub
- 11 Technical Sessions
- 3 Two Minute Thesis Presentation Sessions (for poster presenters)
- 8 Workshops
- 6 learning sessions
- A career fair - with a speed-dating exercise to practice interview skills, get advice and support for young water professionals to develop their career.



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YWP International Conference 2017 (continue)

A change in mind-set is needed to lead the future water sector.

The young professionals at the Conference were united in the need for a significant change in mindset if the water sector is to overcome current and future challenges. Population growth and rapid urbanisation, and the subsequent increased demand for water to meet growing food and energy requirements, are creating immense challenges in an era of climate change, increasing water scarcity and water pollution.

Key messages to emerge from among the young water professionals in Cape Tow, include:• Sustainable Development Goals planning started too late and Young Water Professionals want to consider post-SDG planning as pat of current implementation efforts: ◦ Planning needs to transcend dependency on public administrations, seen as a weakness as these tend to bring new plans every few years that fail to build on previous decisions and efforts.

• In an increasingly interdependent world, cross-sectoral collaboration needs to rapidly increase: ◦ Water is crucial in every part of life, and water professionals are key to delivering water services for both human and environmental wellbeing. Young water professionals from IWA have reached out to start collaborations with other young professionals from related fields such as energy, food and education.

• Action starts with the Individual, and individuals can make a difference: ◦ Attendees wrote Personal Action Cards on how they would contribute to creating sustainable, water-wise cities. Check them out here

Other issues, seen as critical to the future of water management, included:• The financial resilience of water utilities, by diversifying income streams (seeing wastewater as a resource; becoming energy neutral) and ensuring water conservation;• Improving water quality and addressing emerging contaminants, such as removing micro-plastics from water;• Resource recovery and reuse of valuable by-products found in wastewater;• Artificial Intelligence and data for improved decision making;• Vocational training and capacity development.

Save the Date:

YWP 2019

All young, inspiring water professionals are encouraged to join us at the next International Young Water Professionals Conference in Toronto, Ontario, Canada from 23-27 June 2019, organised by the International Water Association together with IWA Canada Young Water Professionals Chapter, will organise the 9th edition in Toronto, Ontario, Canada.

This conference - organized by and for young water professionals - will empower young water professionals to progress further in your water career. With a multi-disciplinary programme you will gain connections, develop yourself professionally and gain recognition for your contributions.

For further details visit: http://iwa-youngwaterprofessionals.org/

IWA
the international water association

Become an IWA member

Not yet a member and interested in joining IWA and specifically HRWM ? Then click on the link below and see how you can become a member of this family. http://www.iwa-network.org/membership.php

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IV Latin American Symposium on Environmental Virology

Article credit: Célia Barardi

The IV Latin American Symposium on Environmental Virology (IV SLAVA) was held from 7 – 9 March 2018 at the Federal University of Santa Catarina (UFSC), Florianopolis, Brazil. The SLAVA 2018 was the fourth event of the series that began in Rio de Janeiro (Brazil) in 2010. The IV SLAVA fulfilled its objectives that were to disseminate the advances and the main issues developed in Environmental Virology in Latin America, as well as to encourage the development of new projects and strengthen the collaboration between the researchers of several institutions. The Symposium was dedicated to the memory of Professor Huw Taylor and was attended by 78 participants, 55 from Brazil and 23 from the other countries: Brazil (55), Argentina (15), Singapore (01), Spain (01), United States (01), United Kingdom (01) and Uruguay (04).

The one day Mini-Course: "Introduction to Microbiological Risk Assessment" by Profs. Maria Inês Zanolli Sato - CETESB, São Paulo / SP and Maria Tereza Pepe Razzolini - University of São Paulo, São Paulo / SP had 26 participants.

Plenary lectures that took place at the event:

1) Opening Plenary Session: Dr. Rosina Girones, "Sensitive detection of food-borne viruses using NGS techniques and evaluation of transmission of excreted DNA viruses "Universidad de Barcelona, Spain- Chairperson: Célia Barardi, UFSC, Brazil

2) Dr. Carlos Campos, Center for Environment, Fisheries & Aquaculture Science (CEFAS, UK) "Progress and challenges in understanding the fate and transport of norovirus in the marine environment" Chairperson: Fernando Spilki, FEEVALE, RS, Brazil.

3) Dr. Stefan Wuertz, Singapore Center for Environmental Life Sciences Engineering (SCELSE) Nanyang Technological University, "Microbial Communities in the Urban Water Cycle: Fate of Pathogens" Chairperson: Maria Elisa Magri, UFSC, Brazil. Note: This conference was given by SKYPE.

4) Dr. José Henrique M. Oliveira, "Disease tolerance as a defense strategy against arbovirus infection in the vector mosquito Aedes aegypti "Federal University of Santa Catarina, SC, Brazil Chairperson: Marize Miagostovich, Fiocruz, RJ, Brazil.

5) Dr. Angela D. Coulliette-Salmond, Center for Disease Control (CDC), Atlanta, GA, USA, "Global Polio Laboratory Network (GPLN) Polio environmental surveillance and CDCs role" Chairperson: MARIA INÊS ZANOLLI SATO - CETESB Paulo / SP - Brazil).

The next SLAVA will be held in 2020 in Buenos Aires, Argentina and will be chaired by Dr. Viviana Mbayed.

The organizing team chaired by Célia Barardi, UFSC

The poster area

Official Symposium Launch and Networking

Women's Day Celebration on 8 March.

IWA World Water Congress & Exhibition 2018

16 – 21 September, Tokyo, Japan

The IWA World Water Congress & Exhibition brings over 5,500 water, environment and related professionals from more than 100 countries and offers new insights into how pioneering science, technological innovation and leading practices shape the major transformation in water management that is underway. Attracting water professionals from over one hundred countries, the IWA World Water Congress & Exhibition provides a unique opportunity to learn about the latest trends in leading practices, innovative technologies and pioneering science. Connecting people from across water and environment fields it showcases successful examples of delivering clean water to growing populations, cleaning up polluted river systems at scale, industrial water management, public – private partnerships for service delivery, new policies and regulations, and benchmarking of water and wastewater service providers. The Congress presents the collective knowledge and know-how through leading keynote speakers, open discussions, presentations, poster sessions, showcasing latest technologies, dialogues on emerging issues, leadership forums and workshops. For further details and important deadlines visit: http://www.iwa-network.org/events/iwa-world-water-congress-exhibition-2018/

For HRWM SG events visit the IWA Connect HRWM webpage for regular updates: https://iwa-connect.org/#/group/health-related-water-microbiology/timeline

The 3rd Regional IWA Diffuse Pollution Conference

Chiang Mai, Thailand, 19-22 November, 2018

The IWA Diffuse Pollution and Eutrophication Specialist Group is organising the IWADP2018 conference, under the theme "Innovation and Frontier Technology for Water Security and Scarcity". Dr. James Ebdon, from the University of Brighton, is among the keynote speakers from around the world. Selected manuscripts will be considered for publication in Water Science & Technology, and Water Science & Technology: Water Supply. This world-class IWA event will be infused with South-East Asian culture, especially with the famous annual Loy Kratong festival in the cultural city of Northern Thailand, and a special exhibition 'Water: Art meets science for our planet'.

For more information and important deadlines, please visit http://www.iwadp2018.nu.ac.th/, or contact Dr. Kwanrawee (Joy) Sirikanchana, the IWADP2018 conference secretariat and the HRWM board member, at iwadp2018@gmail.com.

Special Session:

"Microbial contamination and health", abstract submission deadline: 31 May 2018.

IWA 20th International Symposium on Health-Related Water Microbiology

15- 20 September 2019, Vienna, Austria

Vienna

ÖGHMP
Österreichische Gesellschaft für Hygiene, Mikrobiologie und Präventivmedizin

In 2019 the 20th International Symposium on Health-Related Water Microbiology (HRWM) will take place in Vienna, Austria from 15-20 September. Organized by our IWA Specialist Group it will be hosted by the Interuniversity Cooperation (ICC) Water and Health (co-chairs Regina Sommer and Andreas Farnleitner) and supported by the Austrian Society of Hygiene, Microbiology and Preventive Medicine. According to our long-term tradition our symposium will keep the one session format of oral presentations and enough time for poster sessions with discussions covering all aspects of our scientific field. The involvement of the IWA Young Water Professionals will be a key focus. A workshop in conjunction with WHO is in preparation. The possibility for technical excursions and time for networking, spending time together, enjoying good food and company in a relaxing atmosphere is foreseen. The Symposium website (www.hrwm.eu) with all the information will be launched in April 2018. We are looking forward to welcome you in Vienna 2019.

Regina Sommer, Andreas Farnleitner and the Team of ICC Water & Health

Water Science and Technology: Water Supply

Call For Papers - Special Issue

The IWA journal Water Science &Technology: Water Supply has a call for papers for the special issue on "Water Security and Water Scarcity from Diffuse Pollution and Climate Change", where Dr. James Ebdon and Kwanrawee Sirikanchana, together with Wanpen Wirojanakud and Puangrat Kajitvichyanukul are guest editors. The deadline for paper submission is **August 1, 2018**. Please see more details from the link: http://ws.iwaponline.com/content/call-papers-special-issue

SIWI WORLD WATER WEEK

26 – 31 August 2018, Stockholm, Sweden

World Water Week is the annual focal point for the globe's water issues. It is organized by SIWI. In 2018, World Water Week will address the theme "Water, ecosystems and human development". In 2017, over 3,300 individuals and around 380 convening organizations from 135 countries participated in the Week.

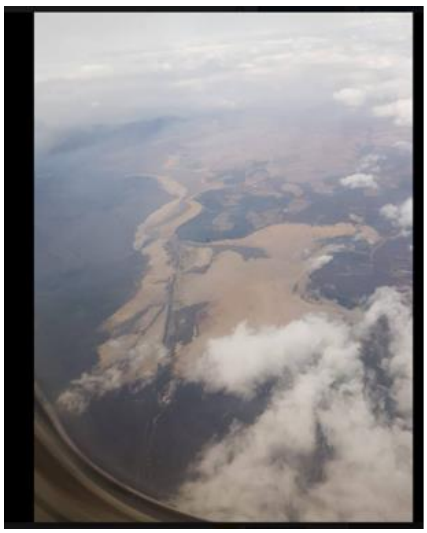
Experts, practitioners, decision-makers, business innovators and young professionals from a range of sectors and countries come to Stockholm to network, exchange ideas, foster new thinking and develop solutions to the most pressing water-related challenges of today. We believe water is key to our future prosperity, and that together, we can achieve a water wise world.

Water Crisis in City of Cape Town, South Africa

Article credit: Bettina Genthe

The effect of climate change is currently being felt in the City of Cape Town with the worst drought experienced in recorded history. The local government implemented demand management schemes to reduce the daily consumption of water by residents in addition to identifying alternative water supplies. This involves expensive infrastructure depending on the options selected. The urgency of the situation has meant the city needed to find ways to speed up the procurement process to allow construction of desalination units and other alternative to begin, in time to prevent "Day Zero" (where the water pipes run dry) from occurring. The drought was re-classified from a provincial disaster to a national disaster, allowing national funding to be made available and legally assigning the responsibility to the national executive to coordinate the disaster. Consecutively stricter water restrictions were introduced as stored water supply reduced. At the moment Level 6B water restrictions are in effect where residents are restricted to the use of 50L per person per day for all domestic purposes such as washing, toilet flushing and consumption. To ensure the water use reduction, the city reduced water pressure and installed water management devices in high users' residence that controls the volume of water accessed daily.

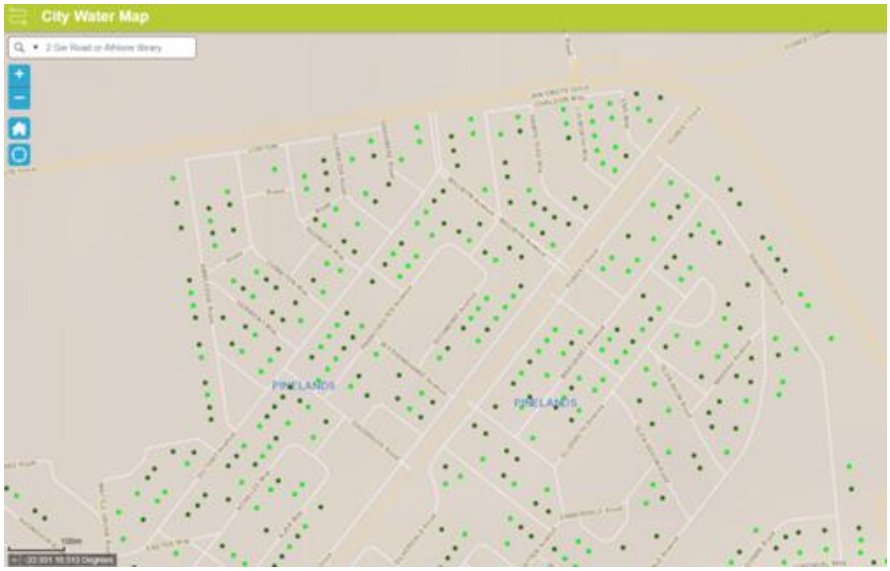
Communities responded in a variety of ways, but most have risen to the urgent call to reduce their water usage. Social media has been effectively used to share water saving tips and construction of greywater collection and storage plans. One such site is a Facebook site called "Water Shedding Western Cape" which has over 150,000 members. Radio talk shows feature water issues on a daily basis, keeping communities informed and inspired. The WWF South Africa prepares a weekly water file with information on different topics and tips to prepare for "Day Zero" (http://www.wwf.org.za/bucket_list.cfm).



Western Cape Water shedding Facebook page to share ideas

Farmers in the Western Cape made a "one-off donation" of 10 million cubic meters (10 billion litres) of water, equivalent to almost 3 weeks of the city's domestic use. Water from farmers' private dams was released into the river to find its way to one of the water storage dams that supplies the city. This involved consultations and agreements with farmers and permission from the City of Cape Town and the National Department of Water and Sanitation to finalise the complex water licensing requirements and permissions the government calls for regarding water use and the movement of water.

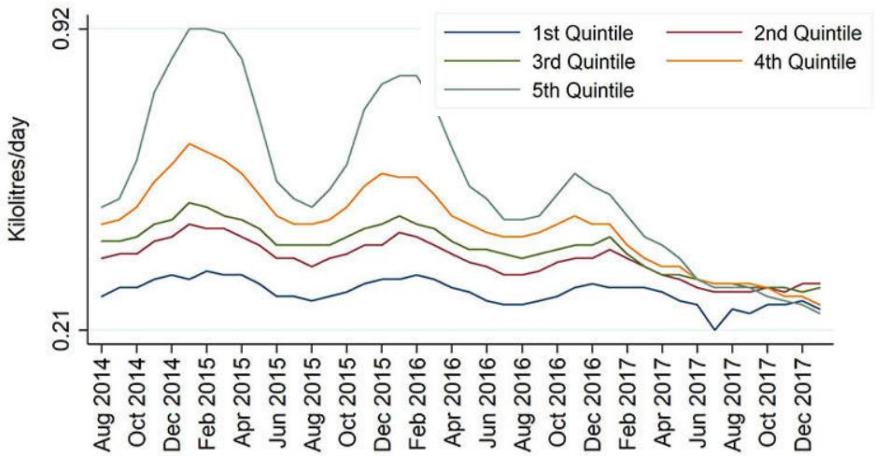
The city created a water map of each residence, showing which households have complied with the restricted water use of a monthly 6000 L per household. Cape Town reduced its water consumption by 60% in only 3 years. Melbourne in Australia on the other hand took 12 years to achieve this. According to Wesgro CEO Tim Harris, this reduction is world-class, setting the benchmark for countries around the world. The UN Special Envoy for Climate Action, Mike Bloomberg, (and former New York City Mayor) visited Cape Town to see the impacts of the drought on Cape Town and the city's response to it.



Water usage map at street level. Dark green dots – household water use is less than 6 kL per month. Light green dots household water use less than 10 kL monthly

Water usage presented as quintiles illustrating how wealthier households reduced water consumption in three years to the same as the lower income group.

https://www.news.uct.ac.za/article/-2018-03-01-cape-town-did-come-together-to-save-water



The Joint Danube Survey – Investigating faecal pollution along the world's most international river

Article credit: Andreas Farnleitner

In 2013 the International Commission for the Protection of the Danube River organized the 3rd Joint Danube Survey to investigate the water quality along the entirety of Europe's second longest river. As part of the survey, researchers from the Interuniversity Cooperation Centre Water & Health in Austria (TU Wien, Medical University Vienna, Karl-Landsteiner-University Krems) and the University of Belgrade, Serbia, monitored microbial faecal pollution levels by standard faecal indicator bacteria along a 2,580 km stretch of the Danube, as well as in the Danube´s most important tributaries. To track the origin of faecal pollution, host-associated Bacteroidetes genetic faecal marker qPCR assays for different host groups were applied in concert with SFIB. The spatial resolution analysis was complemented by a time resolution analysis of faecal pollution patterns over one year at three selected sites (downstream the cities of Vienna, Budapest and Belgrade). In this way, a comprehensive faecal pollution map of the total length of the Danube was created, combining substantiated information on both the extent and origin of microbial faecal pollution. Samples were taken midstream of the river and neat its right and left banks. Midstream samples representatively depicted the microbial pollution levels at the respective river sites. However, at a few, somewhat unexpected sites (no apparent point sources or larger settlements), high pollution levels occurred in the lateral zones of the river while the midstream zone had good water quality. Using host-associated molecular markers human faecal pollution was demonstrated as the primary pollution source along the whole river, while animal faecal pollution was of minor importance. This study demonstrates that the application of host-associated genetic microbial source tracking markers in concert with the traditional concept of microbial faecal pollution monitoring based on SFIB significantly enhances the knowledge of the extent and origin of microbial faecal pollution patterns in large rivers. It constitutes a powerful tool to guide target-oriented water quality management in large river basins and is a prime example for the value of broad scientific transnational cooperation.

This study was recently published in the IWA Journal Water Research:

Kirschner, A.K.T., Reischer, G.H., Jakwerth, S., Savio D., Toth E., Ixenmaier, S., Sommer R., Mach R.L., Linke R., Eiler, A., Kolarevic S., Farnleitner, A.H. (2017) Multiparametic monitoring of microbial faecal pollution reveals the dominance of human contamination along the whole Danube River. Water Res 124: 543-555.

ICC Water & Health

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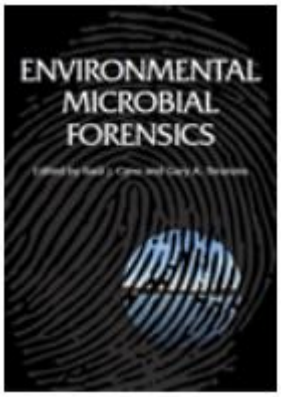
www.waterandhealth.at

New Book:

Environmental Microbial Forensics



Content Type: Monograph

- Editors: Raúl J. Cano, Gary A. Toranzos
- Publication Year: 2018

Microbiology in the service of law and public safety.

Forensic scientists use tools from the natural sciences and engineering to analyze physical evidence. Such evidence might be at a crime scene, a bioterrorism event, at the site of an oil spill or chemical discharge, or when in pursuit of a foodborne infectious disease. Increasingly, microbes are serving as some of that physical evidence. The DNA of isolated microorganisms is being subjected to whole-genome sequencing, while the metagenomes of microbiomes found in the environment are now routinely sequenced and analyzed. Databases of microbial genomes are growing rapidly, and probing those databases with powerful bioinformatics tools and other analytical techniques enables comparative microbial genomics to be applied to forensic analysis.

The powerful genomics tools available today are being applied to forensic analysis of microorganisms in a diverse array of situations. Many of these methods and applications are presented in Environmental Microbial Forensics, edited by Gary Toranzos and Raúl Cano. This fascinating book includes detailed discussions on

◦ Solving crimes using environmental microbial forensics.
◦ Examining human history by studying ancient microbial DNA.
◦ Tracking the culprits of public health crimes to their sources.
◦ Handling microbial samples, choosing molecular methods, and running statistical analyses.

Electronic only, 285 pages, full-color illustrations.

Newsletter Staff

Editor:
Maronel Steyn
Banner photos credit : Maronel Steyn

Editors note

We would like to make this newsletter relevant, with a balance of news and technical input from all SG members. If you have news or contributions that may be relevant or feedback to improve the newsletter, please mail your information to msteyn@csir.co.za The next newsletter is planned for September 2018.