

UNEP GEMS/Water Capacity Development Centre Newsletter

June 2021-December 2021

Hello Everyone,

Happy new year, and welcome to the latest edition of the UNEP GEMS/Water CDC newsletter! During the last six months, we have been very busy here (as usual), with a new intake of students beginning their PGDip and MSc journey in September – welcome to all our new students: we are delighted you can join us and we look forward to working with you over the next few years! Meanwhile, our continuing students have made a great start on their MSc dissertations, with an impressive range of topical projects on water quality from around the globe.

We have had several other exciting developments during this period: we officially launched a range of free and open access courses on the UNEP e-Learning platform during Africa Water and Sanitation Week in November 2021. These courses are self-paced, and anyone who would like to know more about water quality monitoring and assessment can sign up. We will be launching further courses across this range very shortly in 2022 – so keep a close eye on our webpage and social media channels for details.

As you read this, our deadline for accepting Continuous Professional Development course applications for January 2022 has passed, and courses are now fully subscribed. However, do check out these courses if you have not done so already, they are a great way to learn more about water quality monitoring. We will be launching a new call for applications later in 2022 – so if you are interested and want to upskill in water quality monitoring, don't delay, contact us now!

In other news, we continue with a wide range of outreach and networking activities, highlights of this period include presenting to secondary schools on water and Sustainable Development Goal 6 during the Sligo Science Festival, to attending European project meetings on the Erasmus+ programme, and a wide range of publications across different media. Finally, this edition of our newsletter also includes a questionnaire from our former director, and new GEMS/Water ambassador, Dr Debbie Chapman, on an exciting project documenting the history of GEMS/Water engagement over the past half century. Please have a look if you or your organisation have engaged with GEMS/Water in any capacity at any stage during the last 50 years!

Wishing you all the best for 2022.

Dr Timothy Sullivan

Director, UNEP GEMS/Water CDC

Meet the UNEPGEMS/Water Capacity Development Centre Team



Timothy Sullivan

Centre Director: training and advice in freshwater quality, monitoring and assessment.



Deborah Chapman

UNEP GEMS/Water CDC Ambassador: honorary position and advisory role.



Aoife Nagle

Project Coordinator: administration, project and Analytical Chemistry support for the GEMS/Water CDC.



Lucía Hermida González

Programme Coordinator: developing and running our training courses, including the on-line CPDs, PG Diploma and MSc in Freshwater Quality Monitoring and Assessment.



Steve Hutton

Research Support Officer: developing open access training courses and a platform for the WWQA Capacity Development Consortium.



Mary Kate Bolger

Research Assistant: supporting development and delivery of on-line training.



Chinelo Nzekwe

PhD candidate: comparative analysis of heavy metal contamination in freshwater bodies in Europe and Africa using Nigeria and Ireland as case studies. *Supervisors:* Timothy Sullivan & Deborah Chapman.

The UNEP GEMS/Water Capacity Development Centre Team is based in the Environmental Research Institute, University College Cork, Ireland and works closely with our colleagues in the UNEP GEMS/Water Date Centre at the Federal Institute of Hydrology, Koblenz, Germany and the UNEP, Global Programme Coordination Unit in Nairobi, Kenya.

New faces: Staff changes for 2021-22!

As we launch into 2022, we have some exciting announcements to make as some colleagues leave us for new challenges, while others join us for new ventures.

First of all, we would like to extend a (at this stage, belated!) welcome from the GEMS/Water CDC and all friends and partners, to the New Head of the School of Biological, Earth and Environmental Sciences: Professor Astrid Wingler. Welcome Astrid!

For anyone not familiar, the UNEP GEMS/Water CDC is a centre of the School of Biological, Earth and Environmental Sciences (BEES), located in the Environmental Research Institute (ERI) at University College Cork (UCC). For this reason, we welcome and congratulate Professor Astrid Wingler, new Head of the School of BEES since September 2021. Astrid is also Head of Plant Science since 2015 and Professor of Plant Biology.



Professor Astrid Wingler, new Head of the School of BEES, UCC.

Since her appointment as Head of the School, we already had the opportunity to meet with Astrid, fill her in with the latest CDC developments and activities, and discuss new opportunities for the Centre and its engagement with BEES, UCC and the Centre's worldwide activities.

You can see the full profile of Professor Astrid Wingler at the following link:

<http://research.ucc.ie/profiles/D026/astridwingler>

We would also like to announce that Mary Kate Bolger left her position as Research Assistant at the end of 2021 for an exciting new venture. Mary Kate will be very much missed in the CDC, but we wish her the very best in her future projects.

You may also notice that Dr Deborah Chapman (former CDC Director) has been confirmed as a UNEP GEMS/Water CDC Ambassador – and so will remain affiliated with the CDC in an advisory and honorary capacity for 2022, including representing us at some upcoming high-profile conferences.

Finally, we would like to welcome Chinelo Nzekwe to Cork! It's been a hard road to get here from Nigeria in the face of a pandemic, but we are delighted that Chinelo can join us in person here in Cork, and we wish her the very best for her studies in 2022!

An appeal from Dr Deborah Chapman on nearly 50 years of GEMS/Water: We'd like to hear from you!

Many of you know that GEMS/Water was conceived and established in the early 1970s and can boast several unique achievements in its (first) 50 years of existence:

- it developed the first global water quality monitoring network and database,
- conducted the first global assessment of water quality,
- has engaged with more than 100 countries,
- has trained more than 500 people in a standardised approach to monitoring in rivers, lakes, reservoirs and groundwater, and
- ran the first global inter-laboratory quality control exercises.

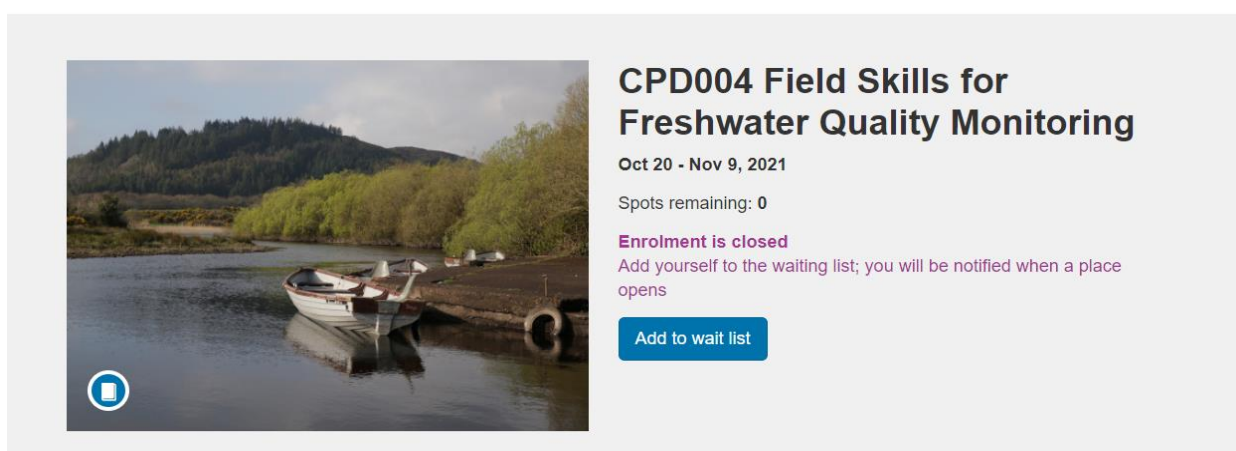
A group of people who have been involved with the co-ordination or leading of GEMS/Water activities over the last 50 years are now in the process of developing a full history of the programme, which we hope to publish next year. As a contribution to this we are seeking your help in tracking the engagement in, and benefits from, participation in GEMS/Water. Please help us by completing the very short and simple questionnaire at the link below by 31st January 2022. The questionnaire is anonymous and no personal information will be used. Please feel free to share the link with colleagues who have been involved with GEMS/Water.

<https://forms.office.com/r/sLk00DZ1SS>

For any queries or comments: please contact Dr Deborah V Chapman, ambassador for the UNEP GEMS/Water CDC: d.chapman@ucc.ie

Virtual Field training in Freshwater Quality Monitoring and Assessment.

In October 2021, we launched our first virtual training in *Field Skills for Freshwater Quality Monitoring and Assessment*. It is a non-credit bearing course but is accredited by and delivered through UCC and the learning platform, Catalog. Originally planned as in-person training, the onset of the Covid-19 pandemic and the associated travel restrictions imposed in many parts of the world put this training on hold. It has now been redesigned as an online course and full details of the can be found in the following link [CPD004-Field Skills for Freshwater Quality Monitoring | University College Cork \(ucc.ie\)](#) and we welcome expressions of interest for the next course iteration, which can be accepted by clicking on *Add to wait list* once you follow the enrollment option in the link above.



CPD004 Field Skills for Freshwater Quality Monitoring
 Oct 20 - Nov 9, 2021
 Spots remaining: 0
 Enrolment is closed
 Add yourself to the waiting list; you will be notified when a place opens
 Add to wait list

Online course *Field Skills for Freshwater Quality Monitoring*
 (<https://open.ucc.ie/browse/all/cpd/courses/field-skills-for-freshwater-quality-monitoring>)

The course uses virtual fieldwork training to demonstrate and practice field sampling and monitoring techniques for freshwater quality monitoring and assessment. It comprises practical exercises for monitoring site selection, sample collection, field-based measurements (chemical and biological), field quality assurance, risk assessments and logistics.

The course is aimed at anyone working in the field of freshwater quality monitoring and assessment who wishes to improve their knowledge and skills in field sampling and measurement techniques, and provides an opportunity for professional development to participants from around the globe, without the added expense of international travel.

During the course, the following is covered:

- Groundwater sampling and microbiological monitoring.
- Measuring stream discharge, taking water samples, and making in situ measurements.
- Sampling site selection and interpreting water quality data: case study of the River Lee catchment (Ireland).
- Sampling and determining water quality using biological monitoring.
- Physical and chemical monitoring (including aspects of Citizen Science).

The course runs for three weeks, during which the students will have the opportunity to sample in their own countries with supplied FreshWater Watch (EarthWatch Europe) field sampling kits.



Secchi tubes as part of the Freshwater Watch field sampling kit (picture by @Freshwaterlizzy)

During the three weeks, apart from the field activities, the students must engage online with the tutors and classmates through online live Q&A sessions.

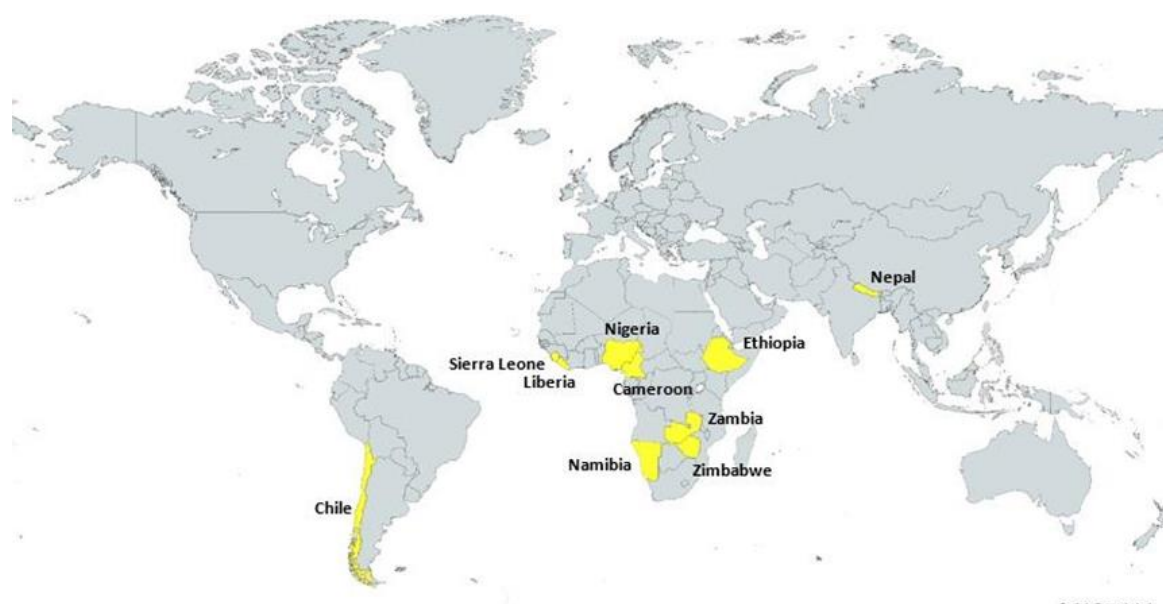


Welcome to the students in the virtual Summer School: Field Skills for Freshwater Quality Monitoring.



Demonstration on the use of the FreshWater Watch field sampling kit during the virtual Summer School: Field Skills for Freshwater Quality Monitoring.

The participants of the course who obtain a minimum of 80 % in the online assignments get a certificate of completion at the end of the course. A total of 20 students were enrolled in October 2021, from 10 different countries.



Countries where the students at the virtual Summer School of Oct. 2021 were based.

During the online sessions, the CDC staff was joined by experts in different areas such as groundwater, microbiological monitoring, physical and chemical monitoring, or biological monitoring like Dr Simon Harrison, Dr Jean O’Dwyer or Dr John Weatherill.



Live online Q&A during the virtual Summer School: Field Skills for Freshwater Quality Monitoring, with Dr Simon Harrison around biological monitoring.

Continuous Professional Development (CPD) courses

The students of the September 2020 intake of our short online courses, the Continuous Professional Development (CPD) courses, finished their courses in January of 2021 and got their final marks at the end of June. Students that successfully completed their studies have already received their Certificate of Completion.

The courses will be running again in January 2022, and we are pleased to see former students coming back to participate in further courses with us.

See below the complete information of the courses available with their respective links:

- *Freshwater Monitoring Programme Design:*
<https://www.ucc.ie/en/cpd/options/science/ev6012/>
- *Quality Assurance for Freshwater Quality Monitoring:*
<https://www.ucc.ie/en/cpd/options/science/ev6013/>
- *Data Handling, Assessment & Presentation for Freshwater Quality Monitoring:*
<https://www.ucc.ie/en/cpd/options/science/ev6014/>
- *Water Quality Monitoring and Assessment in rivers/lakes/reservoirs:*
<https://www.ucc.ie/en/cpd/options/science/ev6015/>
- *Water Quality Monitoring and Assessment of Groundwater:*
<https://www.ucc.ie/en/cpd/options/science/ev6016/>
- *Freshwater Quality Monitoring with Biota and Particulate Matter:*
<https://www.ucc.ie/en/cpd/options/science/ev6017/>

You can find a link to the brochure for the short on-line, CPD, courses here:

<https://www.ucc.ie/en/media/research/watercapacitydevelopmentcentre/CPDShortCourses.pdf>

Application forms and more information of the courses is available at

<https://www.ucc.ie/en/gemscdc/onlinecourses/>

Postgraduate Diploma (PGDip) and MSc in Freshwater Quality Monitoring and Assessment

In August, the students of the second year of the PGDip in Freshwater Quality Monitoring and Assessment finished their programme. We are delighted that fourteen (14) students have decided to continue with their studies and are now enrolled in a third year with the aim of completing their MSc dissertations in Freshwater Quality Monitoring and Assessment. So far, they have finished their Research Proposal and are immersed in the early stages of their projects. We are looking forward to working closely with them in their third-year projects and to see them grow as scientists and researchers in freshwater quality.

Unfortunately, due once again to the Covid-19 pandemic, we did not meet face-to-face with this cohort of students as per usual for field courses. So, as per other planned field courses, we developed an online training course instead which was well received, and included a wide range of field exercises for students in their country of origin, live sessions, video material on locations in Ireland, and which even included a live online identification of macroinvertebrates in samples from around the globe.



Live online Q&A and demonstration of sampling techniques during module EV6004 (Freshwater quality monitoring in the field).



Live online identification of macroinvertebrates with Dr Simon Harrison (pics by student Caitlan O'Keeffe (USA)).

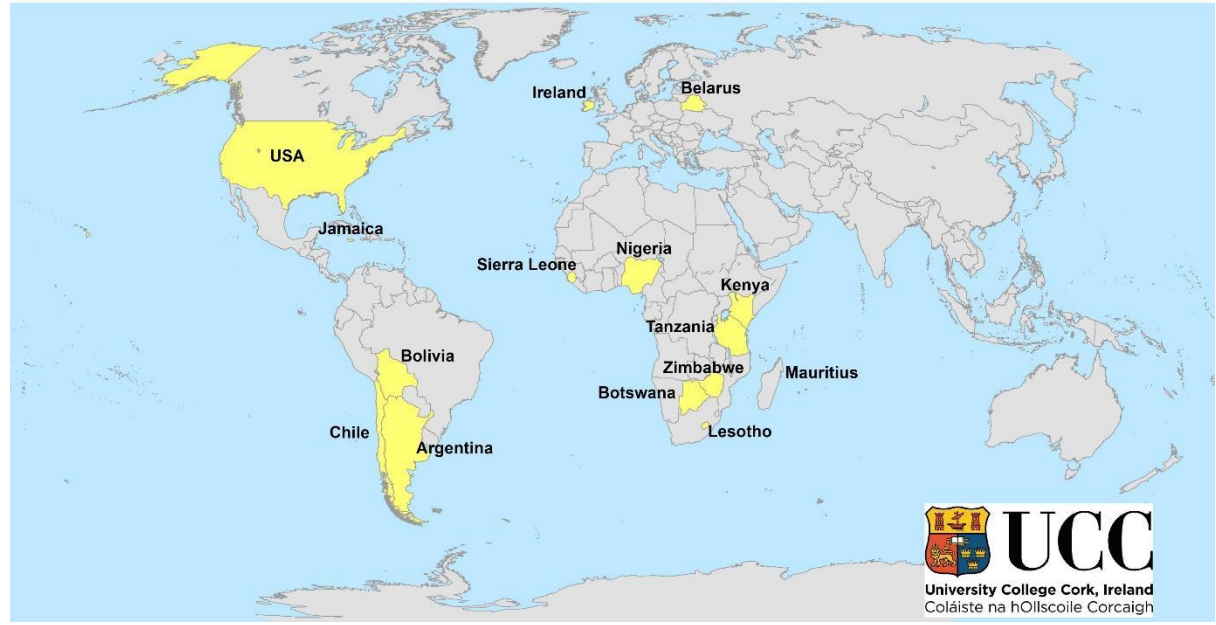
Six of our students from the very first cohort of the MSc delayed the finalisation of their research projects (EV6010: *Dissertation in Freshwater Quality Monitoring and Assessment*) for Year 3 due to the impact of Covid-19 pandemic in their countries. However, we are very proud that last July we were able to celebrate with them (online) as they graduated with their MScs in *Freshwater Quality Monitoring and Assessment*! Congratulations to everyone, and we are really looking forward to keeping you updated with their new and exciting projects.



Left, celebrating online the conferring ceremony of our MSc students (right).

Of course, if you, or anyone you know might be thinking about enrolling (or indeed participating in any of our courses) you can find further information on our website, and specifically on our PGDip here: <https://www.ucc.ie/en/ckr55/> or MSc: <https://www.ucc.ie/en/ckr17/>. However, do keep in mind that applications for our PGDip and MSc won't open again until summer 2023!

The intake of new students of the Postgraduate Diploma and MSc started in September 2021. This time around we have in total students from 15 different countries, which constitutes a great opportunity to share knowledge and experiences in freshwater quality monitoring and assessment all over the world.



Countries of origin of our new intake of students (September 2021) of the PGDip and MSc in Freshwater Quality Monitoring and Assessment.

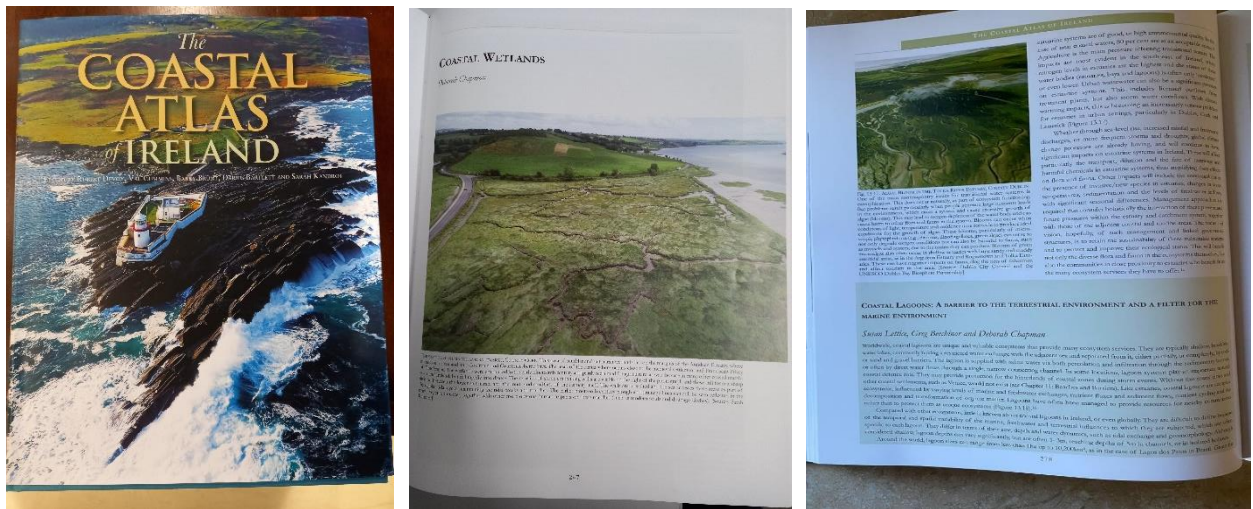
Publications

The CDC is actively involved in the latest research in water quality monitoring and assessment, and so actively publishes in wide variety of different formats each year. Below is a selection of different publications in different areas for this period.

The Coastal Atlas of Ireland with contributions from former and current staff of the CDC has been published. The book includes a special mention to our former colleague and friend, Dr Susan Lettice, who sadly passed away before the book was finished.

Chapman, D., 2021. Chapter 12: Coastal wetlands. In Devoy, R., Cummis, V., Brunt, B., Bartlett, Darius and Kandrot, S., [eds.], 2021. *The Coastal Atlas of Ireland*. Cork, Cork University Press. ISBN: 97811782054092.

Lettice, S., Beechinor, G. and Chapman, D., 2021. Coastal lagoons: a barrier to the terrestrial environment and a filter to the marine environment. In Devoy, R., Cummis, V., Brunt, B., Bartlett, Darius and Kandrot, S., [eds.], 2021. *The Coastal Atlas of Ireland*. Cork, Cork University Press. ISBN: 97811782054092.



Cover of *The Coastal Atlas of Ireland* and pictures of some of the contributions made by former and current staff of the UNEP GEMS/Water CDC.

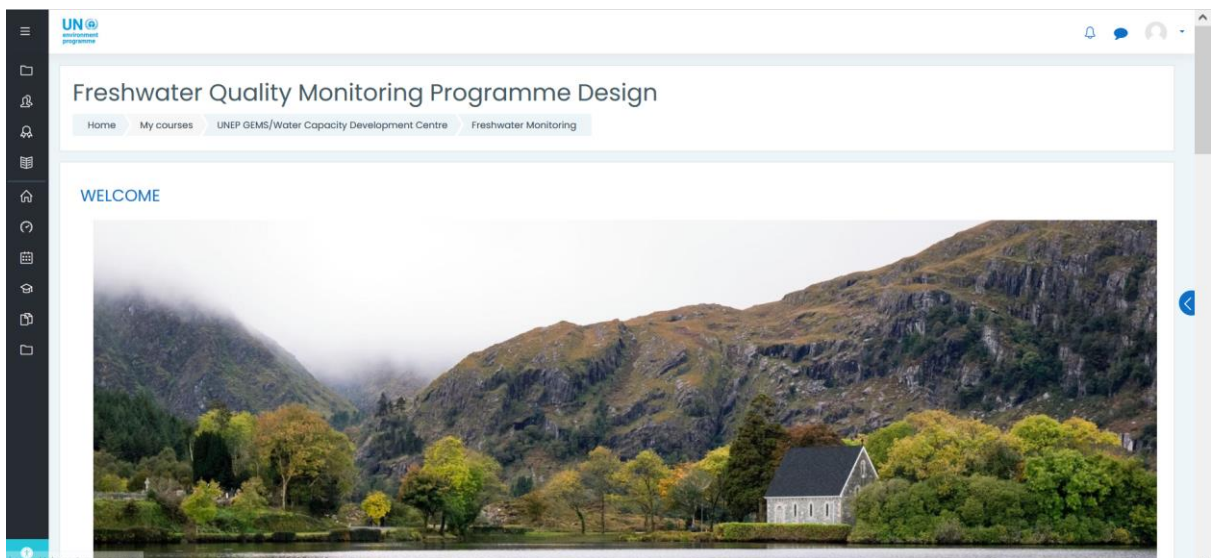
Binner H, Kamali N, Harding M, **Sullivan T., 2021.** Characteristics of wastewater originating from dental practices using predominantly mercury-free dental materials. *Science of The Total Environment*. p. 152632.

Taylor, J., Graham, M., Louw, A., Lepheana, A., Madikizela, B., Dickens, C., **Chapman, D.V.** and Warner, S., 2021. Social change innovations, citizen science, miniSASS and the SDGs. *Water Policy*. <https://doi.org/10.2166/wp.2021.264>

O'Callaghan, I., Fitzpatrick, D. and **Sullivan, T., 2022.** Thiophilicity is a determinant of bioaccumulation in benthic fauna. *Environmental Pollution*, 294 p. 118641.

Open Access Capacity Development training materials

We continue working in a series on Open Access courses, several of which are already available through UNEP's eLearning platform (<https://elearning.unep.org>), with several more to launch in early 2022 (details below), and a wide range of comprehensive handbooks in freshwater quality monitoring and assessment. Watch this space as we will be finalising the availability and details of these publications very shortly!



Interface of the course *Freshwater Quality Monitoring Programme Design* by UNEP GEMS/Water in the UN Environment eLearning platform.

Four courses will be available at the beginning of 2022. These courses focus on the design of a freshwater quality monitoring programme; quality assurance; water quality monitoring and assessment in rivers, lakes and reservoirs, and biota.

The courses are fully online and self-paced. The lessons of the courses will be distributed each week as you progress, and you will be able to self-evaluate your progress through a series of Multiple-Choice Questions (MCQs). A certificate of completion will be issued for those achieving an overall score of at least 80 %.

Outreach and networking

The CDC continues to be very actively involved in networking and outreach events around water quality and SDG 6, and during this period we have been involved in a wide range of events, from national events like the Sligo Science Festival (<https://sligosciencefestival.ie>) in Ireland to European and global project meetings and proposals. A major highlight was participation in the Erasmus+ WATER Project meetings in Valencia, Spain, by Dr Tim Sullivan and Dr Lucía Hermida González detailed below.

Erasmus+ WATER Project



The UNEP GEMS/Water CDC is partner in the Erasmus+ WATER - Work based Learning Paths in Water Management Project ([News | University College Cork \(ucc.ie\)](#)).

The WATER project has for objective the exchange of good practises for efficient and sustainable water resources management approaches and tools. The aim of training visits within the project are to exchange and innovate around educational water programmes of the countries involved by bringing together enterprise and research institutes.

The UNEP GEMS/Water CDC contributes by contributing experience on third level education and training with our post-graduate courses. This project is even more important if we consider that almost all of our students are full time working professionals in the water sector, closing the gap between the research and the professional arena, updating knowledge and skills in the water sector, more specifically in monitoring and assessment of the quality of freshwaters worldwide.

More information about the project can be found at [Water Management – Associazione Foris – Brindisi – Corsi di Formazione](#)

On December 2019, Dr. Deborah Chapman and Dr. John Weatherill, visited Bari (Italy) for the first meeting of the Erasmus+ funded Water Project ([News | University College Cork \(ucc.ie\)](#)). In November 2021, the new director of the Centre Dr Tim Sullivan and the Programme Coordinator Dr Lucía Hermida visited Valencia, the second stop of the project. The Polytechnic University of Valencia (UPV) kindly hosted the meeting that took place in the Research Institute of Water and Environmental Engineering (IIAMA). The training included daily visits to various organizations involved in water management at different levels.

Topics presented included the impact of climate change in water resources availability; options for demand management and systems management; software demonstration for design and management of wastewater treatment plants; presentation of case studies such as the sustainable management of the Eastern Mancha aquifer in the Júcar River basin or the transfer Júcar-Vinalopó; or the management of landfill gas and leachate production.



From left to right and from top to bottom, one of the Erasmus+ WATER sessions in Valencia, visit to the Júcar River Basin District Authority, laboratory facilities at Global Omnium GOLab and the Global Omnium Manises Ribarroja Water Purification Plant.

Virtual Africa Water and Sanitation Week 2021

Another major event in our calendar was attendance and participation in Virtual Africa Water and Sanitation Week 2021: Agenda ([pathable.eu](#)), where GEMS/Water and the CDC participated in a session organised by UNEP, and where we officially launched the free open access course in water quality on UNEP's eLearning platform. The details and recordings of this session (and the complete programme) can be found at the link above, but please do contact us if you would like further information on any aspects.

That brings us to the end of this newsletter and to the closure of another year where the consequences of the Covid-19 are unfortunately still present in every aspect of our lives. We would like to thank the UNEP GEMS/Water CDC staff, collaborators, partners, and all of our students, who despite juggling their various responsibilities and the impacts of Covid-19, find the time and energy to keep going with their studies to make a positive impact in water quality in their communities, their countries and ultimately to contribute that everyone has access to clean water and sanitation.

Again, our best wish is for you all to keep safe, with solidarity and respect, which is the only way to move forward and improve the health of each of us. Thanks so much for your enthusiasm, encouragement, and contributions to the UNEP GEMS/Water CDC.

Keep an eye on our [website](#) (which is currently undergoing some updates and changes) and social media for the latest updates and further information.

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<https://www.ucc.ie/en/gemscdc/>

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[GEMS/Water CDC](https://www.youtube.com/channel/UCGEMSWaterCDC)