

# Executive Interview with Dr. Shane A. Snyder, 2021 Clarke Prize Laureate



We had the honour to speak with Dr. Shane A. Snyder on his recent conferral. Awarded annually by the National Water Research Institute (NWRI) to thought leaders in water research, science, technology, or policy since 1993, the [Athalie Richardson Irvine Clarke Prize](#) (or Clarke Prize in short) is recognised by the International Congress of Distinguished Awards as one of the most prestigious water awards in the world.

A professor at the School of Civil and Environmental Engineering, Nanyang Technological University (NTU), Singapore, and Executive Director of NTU's Nanyang Environment and Water Research Institute (NEWRI), Dr. Shane also spoke about his research career, upcoming plans for NEWRI, as well as his association with the [Singapore International Water Week \(SIWW\)](#) – going way back since the inaugural SIWW in 2008.

**Q: Congratulations on being conferred the 2021 Clarke Prize! As the 2021 laureate, you join a long list of past luminaries who have been recognised for their achievements in water science and technology. How do you feel about winning this prestigious award?**

I am tremendously honoured to receive the 2021 Clarke Prize and to join the previous Laureates, all of whom I deeply respect. All of the Clarke Prize Laureates are extremely well-known within the water science domains; thus I am humbled to now join this distinguished group of leading experts in the field.

**Q: Can you share with us more about your two-decade long research work in water and some of your most significant career highlights to-date?**

My journey to work in the water domain really began as a child, where my family was impacted by groundwater contaminated by a landfill quite far away from our home. It was hard for me to imagine how contaminants could move so far through the groundwater. This water contamination influenced my parent's decision to sell a 200-year old home that was in our family for two generations and to relocate.

During my undergraduate study in Chemistry, I began to work on a research project involving abatement of lead leaching from certain types of alloys used in water meters. As I decided which direction to go for my PhD, I learned about Professor John Giesy from Michigan State University (MSU). Prof Giesy was very keen to recruit me because of my chemistry background to conduct studies that help determine the causes of endocrine disruption seen in animals in the Great Lakes region of the USA. I was astounded by the information he shared and decided to pursue my PhD with Prof Giesy as my mentor at MSU.

While my initial research did focus on the Great Lakes region, around 1996 I was contacted by the Southern Nevada Water Authority (SNWA) regarding the discovery of hermaphroditic fish in Lake Mead, Nevada USA. Quickly, SNWA funded a large project to study the occurrence, fate, and impact of endocrine disruptors on fish in Lake Mead as well as treatability using ozone. On the 1st of January the American Chemical Society (ACS) journal, "Environmental Science & Technology" included a news article about our discovery at Lake Mead, which began with: "For the first time in North America, high levels of natural and synthetic hormones in municipal wastewater treatment plant effluent have been found in the Great Lakes region of the USA." This was a significant milestone in my career and the field of water science.

treatment plant effluent have been linked with endocrine disruption in fish.” Indeed, the research conducted at Lake Mead led to numerous publications and reports that have been cited thousands of times.

The work at Lake Mead inspired my interest in water reuse, as the Las Vegas region relies on wastewater effluent returned to Lake Mead (the source of drinking water for the region) to remain sustainable. From this point forward, I never looked back, I continue to study water reuse systems around the world. I was hired as one of the first research staff of SNWA in early 2000, where I learned a tremendous amount about how public water agencies operate and the challenges of dealing with citizen concerns over water quality. Over the next decade, I helped SNWA build a strong R&D team ultimately with the strong support of the SNWA General Manager, Ms. Patricia Mulroy. During my entire professional career, Pat Mulroy will always be one of the people I hold high as a brilliant and compassionate leader. In 2010, I sadly resigned my position at SNWA to accept an academic position, but I continued my research in water reuse and contaminant removal during various treatment processes.

**Q: We were told that your love affair with Singapore started during the inaugural SIWW in 2008! Care to tell us how you eventually landed onto the leadership position within NTU's Nanyang Environment and Water Research Institute (NEWRI)?**

I still remember the letter I received about the inaugural SIWW in 2008 along with a leadership forum. At that point in time, I had never been to Singapore or even Southeast Asia. I was very pleased to find out that SNWA's leader, Patricia Mulroy, also had been invited to SIWW. Thus, she organised a group of us to attend SIWW and learn more about Singapore's inspiration and aspiration to become a leading country in the world in the areas of water technology and management.

During the 2008 SIWW, I became increasingly impressed by the depth and ingenuity of Singapore's PUB, the local Universities, and the diversity of private sector firms located in Singapore. I came to learn of the Visiting Professor Program (VPP) and was very pleased to be offered a VPP position at the National University of Singapore in 2011, a position I continued until the end of 2017. In February 2018, I became a full-tenured Professor at Nanyang Technological University, Singapore (NTU) and to also lead the Nanyang Environment & Water Research Institute (NEWRI) as the Executive Director of the institute. I was further blessed to be granted a permanent residency (PR) status in Singapore and I continue to enjoy the wonderful research and social environment of Singapore.

**Q: A key ethos of the Nanyang Environment and Water Research Institute (NEWRI) which you helm, is to address Singapore's national priorities in water and environmental needs through the building of technology bridges. This means fostering a NEWRI ecosystem that interacts across a multi- and inter- disciplinary platform of 'Research-Engineering-Deployment (RED) activities. What are some upcoming plans and research focus areas for NEWRI in the coming years?**

NEWRI is a large pan-university institute that is fortunate to have a diverse multi-disciplinary group of faculty, staff, researchers, and students. NEWRI has unique strengths in biotechnology, green chemistry, membrane technologies, resource recovery, and environmental modelling and sensing, among others.

NEWRI has now entered its 4th tranche (TR4) of funding, which will continue for the next five years. During the transition to TR4, NEWRI was able to procure new equipment that expands our capacity in areas such as bioassays to measuring mixture toxicity, the latest generation of mass spectrometers for identification and quantification of environmental contaminants, and genomics platforms for pathogen tracking and bacteria flora identification in biotechnologies.

Beyond these new areas of exploration, NEWRI remains focused on means to reduce the energy needed for desalination, to recovery valuable materials from brines and other waste streams, water treatment processes to reduce sludge volume, and various technologies to recover resources from sludge.

NEWRI will also continue to expand our research in solid-waste treatment and waste upcycling. Our Waste to Energy Research Facility (WTERF) continues to operate using essentially 100% of the solid waste from the NTU campus and we have recently been awarded several grants that utilise this facility to increase energy and hydrogen yields, among others. Thus, we can expect NEWRI to continue our RED journey and to focus even more on areas of national interest, yet with a global outlook as far as the impacts of the technologies we develop.

**Q: Singapore positions itself as the global hydrohub for water technology and solutions. Having lived and worked here for the last few years, what do you think makes the water ecosystem in Singapore work?**

It is hard to believe that I first came to Singapore over 13 years ago, and I have lived in Singapore full-time since the summer of 2017. Singapore has created a unique and highly successful ecosystem for water technology development and deployment.

First, Singapore has a long history of recognizing and addressing the delicate nature of water sustainability on a rather small ge with very high urban density. Singapore is unique in their investments into modern technologies and management approaches. This is

especially true for an academic like me, whereby there are many opportunities to conduct research and to commercialise the resulting technologies.

Beyond Singapore, the country is in a strong position to collaborate with numerous private and public sector entities within Southeast Asia. While SEA continues to grow rapidly, there are critical water sustainability needs in the region where Singapore is already positioned in a leadership position. I very much appreciate the strong support from the Singapore government as well as the private sector, which has empowered NEWRI to meet and exceed all the key performance indicators (KPIs) set forward in our core institute funding.

**Q: Singapore International Water Week returns next April as a fully physical event, with focus on key emerging themes such as digital water, climate resilience, resource resilience, sustainability, amongst others. Having attended every edition of SIWW since 2008, what will you be looking forward to the most at SIWW2022?**

Indeed, I have happily attended each SIWW since the beginning. While the virtual SIWW was successful and enabled dialog with a large diversity of water scientists and policy makers, I greatly missed being live with my colleagues and friends. Moreover, I always enjoy the Expo at SIWW where I can learn about the latest and greatest advances in water technologies. Thus, I am extremely pleased that SIWW will be back in April of 2022! NEWRI will have a booth in the expo, so I also look forward to the opportunity to share more information about NEWRI's technologies and capabilities during SIWW.

**Q: Any final words or thoughts?**

The Clarke Prize award was a career goal for me, and I am humbled to stand among the numerous Laureates who have already received this prestigious and generous award. I absolutely owe a debt of gratitude to Singapore's PUB, other Singapore agencies, National University of Singapore, and NTU who enabled my ability to have a far more global view on water reuse and water quality issues. Without question, the move to Singapore was a great choice and likely influenced the outcome of this year's Clarke Prize.

Executive Interview with Nimesh Modak, Managing Director, Imagine H2O Asia

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