

Rolling the Dice

Mathematical modeling expert draws parallels between simulators, board games

Michelle Kuester

At a Glance

Name: Spencer Snowling

Occupation: Director of Water Digital Solutions at Hatch (Mississauga, Ontario, Canada)

Water sector experience: 26 years

WEF membership: 24 years

Described in three adjectives: Creative, engaging, enthusiastic

Favorite food: Thai cuisine



Spencer Snowling is heavily involved in developing the latest mathematical modeling and simulators for the water sector. Marnie Burgess

Spencer Snowling is a strategic thinker. As Director of Water Digital Solutions at Hatch (Mississauga, Ontario, Canada), he has spent the past 26 years building and refining mathematical modeling software that enables operators to better understand their water resource recovery facilities (WRRFs). Snowling's career mirrors one of his favorite pastimes — playing tactical board games with friends and family.

A New Game Plan

Snowling began his education at McMaster University (Hamilton, Ontario), where his interest in groundwater led him to study civil engineering and management during his undergraduate program and environmental geochemistry as a graduate student. However, while studying for his doctorate degree, he made connections with individuals from Hydromantis (later acquired by Hatch in 2021) who offered him a role developing WRRF modeling systems — the position he is still enjoying today.

"I've been lucky to have the chance to travel all over North America and other parts of the world where everybody has

very similar challenges of being able to run their wastewater treatment plants in an efficient way, in a robust way," he said. "I've been blessed to be able to have a very specific set of skills and to work with some of the most talented people in that area over the years."

Embracing New Technology

Snowling has seen several changes since he began his career in 1999, both in the mathematical modeling field and across the water sector.

"When I came into the industry, modeling and simulation were very much seen as an advanced application," he explained. "Over the years, that modeling has become such a standard feature of designing wastewater treatment plants, and it's not quite the unique, special thing that it was back then. I'm very happy to say that the technology has been well-adopted across the entire industry."

Also, when Snowling started in the sector, greenhouse-gas modeling was just

emerging. Now, he is creating models for per- and polyfluoroalkyl substances (PFAS) contamination and exploring how artificial intelligence might complement traditional process modeling.

"They're kind of two different approaches that aim toward doing the same thing," he explained. "What I hope for the future is that there's still room for both of these approaches. We still want to have engineers who understand all of the details of the process models and be able to apply that knowledge and understanding that's been built into and gathered into the software over several decades now."

Working on a Team

Much like his favorite cooperative board games where players work together to defeat an in-game adversary, Snowling's work incorporates understanding complicated systems to make strategic decisions, and in turn, observing the effects of those



Spencer Snowling plays the board game SETI: Search for Extraterrestrial Intelligence. Snowling and his wife Marnie Burgess enjoyed hosting a neighborhood board-game club when their children were young. Marnie Burgess

Marnie Burgess



Spencer Snowling conducts a workshop at WEFTEC. Camille Dominguez

decisions — hopefully, conquering the issue at hand.

"To me, board games are, in essence, just an extension of the idea of the simulator," he explained. "You're doing a representation of some crazy thing that you wouldn't normally be involved with, like running a big battle."

Snowling also made the apt comparison to board games in his role coordinating the Process Control Event during WEFTEC's Operations Challenge, a teams-based competition testing essential skills in the frontline water sector. For nearly a decade, Snowling has lent his expertise and enthusiasm to the event, which consists of a written exam and a simulator that tests operators' problem-solving skills. Teams must quickly diagnose and resolve simulated WRRF issues, much like players navigating a complex board-game scenario.

"The teams are like, 'I see the state of this system. It's not removing enough ammonia. I'm going to do this.' And they try something, and then the system responds," he explained. "It's just the way it goes in the board game. I'm making a choice based on what I see going on in the game, and then the game responds."

"The [Operations Challenge] teams are so good. It's so hard to keep ahead of them," Snowling continued. "Every year, I'm thinking, 'Okay, this is it. We've made it so hard, nobody's going to get over 700 points out of the 1000.' Then somebody will come along and get 900. It just blows my mind. ... It's made my understanding of the wastewater world better."

Snowling finds joy in teaching, whether he is working with modeling simulators, guiding Operations Challenge teams, or running workshops at WEFTEC.

"One of the absolute best parts of simulators is being able to use it to teach people things, to allow them to experiment and work at their own pace and supplement their own

understanding. It's a little bit like a video game," he said. "I really enjoy helping people go through that journey of, 'Oh, I broke it. How can I fix it?' and getting them from point A to B." ❧

Michelle Kuester is Associate Editor of WE&T. She can be reached at mkuester@wef.org.

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