



**[00:00:00.650] - EH Nexus Host**

Hello everyone, and welcome to today's Centers for Disease Control and Prevention's Environmental Health Nexus podcast, where we explore critical topics in environmental health. In today's episode, we have the pleasure of speaking with Dr Bryan Brooks, a distinguished environmental science and public health professor at Baylor University. Dr. Brooks is the Director of the Environmental Health Science Program accredited by the National Environmental Health Science and Protection Accreditation Council. He also holds the position of Editor-in-Chief of Environmental Science and Technology Letters, published by the American Chemical Society publications. Throughout his career, Dr. Brooks has published more than 300 manuscripts, and his research has garnered support from leading organizations like the CDC, the National Institute of Environmental Health Sciences, and the National Science Foundation. In our conversation today, we'll dive into Dr. Brooks' career journey, the significant impact of his research, and his perspectives on the most pressing and emerging issues in environmental health.

**[00:01:09.330] - Dr. Bryan Brooks**

Thank you for having me.

**[00:01:11.380] - EH Nexus Host**

Dr. Brooks, your journey in environmental health science is incredibly inspiring. Could you share with us some of the pivotal moments or experiences that sparked your interest in this field and guided your career path?

**[00:01:25.590] - Dr. Bryan Brooks**

Well, first, thank you for the opportunity to chat today. You know, the importance of teachers and mentors cannot be overstated. When I was an undergraduate, I was fortunate to take a water course as an elective class, and this class opened up a whole new world. I then performed undergraduate research with the instructor of that class and continued to pursue a master's degree under their mentorship. Similarly, my doctoral or PhD mentor was essential to my career development. They both took a chance on a curious student, and for this, eternally grateful.

**[00:02:02.480] - EH Nexus Host**

You've published an impressive body of work with over 200 scholarly publications. Out of all your research, what would you say are the most impactful findings or contributions? How have these shaped environmental health science and influenced policy on a larger scale?

**[00:02:20.160] - Dr. Bryan Brooks**

Although our research team and I have many research interests, we really started examining water research questions in urbanizing regions, which led to studies of different types of chemical contaminants of emerging concern. Working with students and other colleagues, we have aimed to advance our understanding of chemical fate, hazards and risks, and to develop approaches to manage these risks to public health and the environment. And one of the unique aspects of our work is that we've focused on understudied chemicals. Some of the contributions have been implemented in national and international policy activities. You know these research efforts have required engaging both basic and translational studies of relevance to the science and also to the practice of environmental public health.

**[00:03:12.100] - Dr. Bryan Brooks**

In addition to our research team's individual activities, we've also been involved in what some people call the science of science. One example that I can share with you is that I worked on a project that involved thousands of scientists and engineers from different sectors, like government, academia, in industry and not-for-profits around the world. We collaborated to identify priority research needs for achieving more sustainable environmental quality. I was fortunate to lead the efforts in a transparent, bottom-up, and inclusive process by organizing a number of synthesis workshops to bring together the ideas from so many people.

**[00:03:53.840] - Dr. Bryan Brooks**

And what we've seen is that governments, industry groups, and not-for-profit organizations have selected a number of these research needs to invest significant research funding in various countries around the world. I was also very fortunate to serve as principal investigator for the UNCOVER EH, which stands for understanding needs, challenges, opportunities, vision, and emerging roles in environmental health initiative with the CDC's NCEH. Similar to what I was describing above, UNCOVER EH was a transparent bottom-up exercise that engaged environmental public health practitioners working at local, state, tribal, territorial, and federal health departments with the aim of understanding the workforce and identifying challenges and opportunities to advance the practice. Similarly, findings from UNCOVER EH have been used by government agencies and not-for-profits to stimulate workforce initiatives, fund strategic research activities, as well as other positive impacts.

**[00:05:03.860] - EH Nexus Host**

Mentoring seems to be a cornerstone of your work, especially in guiding students through research. Could you share an example of a mentee's success that illustrates the impact of your mentoring philosophy?

**[00:05:17.220] - Dr. Bryan Brooks**

Sure. There are many examples as I've been blessed to work with so many talented students over the years and continue to do so. I would offer the example of Kaitlyn Kelly, who completed a Bachelor of Science degree in Environmental Health Science through our EHAC-accredited program at Baylor University. Kaitlyn, who is from California, engaged in diverse research activities during her time with us as an undergraduate. From these efforts, Kaitlyn published a first-authored manuscript on water quality and antibiotic resistance in 2018. Of course, antibiotic resistance is a leading global health threat. This particular paper has been impactful, and even though it's only been published for a few years, it's already been cited over 70 times. But Kaitlyn was interested in science practice interfaces, so she also worked with us and the research team on the UNCOVER EH initiative I mentioned earlier today. A career-defining moment for her happened when she received a National Environmental Public Health Internship Program position. This NEPHIP program is really quite incredible, because Kaitlyn was with a local health department in the State of Washington; and during her NEPHIP Internship experience, she became very interested in wildfire smoke and impacts on public health.

**[00:06:43.240] - Dr. Bryan Brooks**

Because of those experiences, Kaitlyn went on after her undergraduate studies to the University of Washington, where she earned a Master's of Public Health in Environmental and Occupational Health, specifically focusing on interventions to protect people in local communities from wildfire

smoke and other air contaminants. She continues these activities now by working with the State of Washington on wildfire smoke and public health.

**[00:07:11.050] - EH Nexus Host**

Your research spans a wide range of topics, and you collaborate with students and experts from various disciplines. How do you bring together such diverse expertise, and what role does interdisciplinary collaboration play in addressing complex health and environmental challenges?

**[00:07:29.020] - Dr. Bryan Brooks**

Interdisciplinary disciplinary training is essential, given the complexities of the multifaceted challenges that we face in society here in our country and so many regions around the world. So, we routinely work with students and other colleagues from different disciplines. For student training, my approach has always been to understand the students' interests first, try to meet them where they are in terms of their educational journey, and then try to facilitate opportunities for them to learn. You know, Socrates is often credited for saying, I cannot teach anybody anything. I can only make them think. At Baylor, we tend to embrace Socratic teaching methods, and we aim to provide opportunities to support development of critical thinking skills. So, I work with other colleagues from different disciplines because I believe a key consideration of training is to welcome expertise, and solicit insights from these other disciplines. These perspectives are needed, routinely to define and manage complex environment and health issues.

**[00:08:35.640] - EH Nexus Host**

Dr. Brooks, looking ahead, what do you see as the most pressing issues or emerging trends in environmental health science that need immediate attention?

**[00:08:46.080] - Dr. Bryan Brooks**

You know, from a student training perspective, we face a national workforce shortage of environmental health science practitioners. I continually am receiving more more career opportunities from industry and government, than we actually have students graduating. So we really need to train more well-prepared graduates to meet these pressing workforce demands. After all, environmental health is the backbone of public health, and everyone in every community depends upon the effective delivery of essential services and core environmental health programs. From a broader global perspective, there are many challenges we face, but these challenges also represent opportunities for innovation. For example, more people live in cities at a global scale, and demographic transitions to cities will continue to occur. At the same time, chemical production is increasing, and chemical use is becoming even more concentrated, similar to the way we consume water, food, and energy in these urban areas. At the same time, waste

streams from these urban regions are also increasing. It's important to note that the trends I've just described are occurring faster than sustainable systems and interventions are being implemented in many regions around the world. As we move forward, we're noticing more and more how public health, biodiversity, and the services provided by ecosystems are being affected.

**[00:10:17.210] - Dr. Bryan Brooks**

Diseases that don't spread from person to person are becoming more common worldwide, and we're seeing biodiversity decline at noticeable rates, really unprecedented, according to some reports. But we do understand how closely linked human health is to the quality of the environment. So we need to improve chemicals, waste, and pollution prevention at the global scale. Advancing innovation in areas such as sustainable and green chemistry and engineering, and particularly for resource recovery, while managing natural resource supply chains and protecting public health, the environment, will be key going forward.

**[00:10:56.220] - EH Nexus Host**

Your commitment to nurturing the next generation of environmental health professionals is clear. What advice would you give to students or early career professionals entering this field?

**[00:11:08.370] - Dr. Bryan Brooks**

I would suggest that you seek out committed mentors, both when you're at university and then also within your professional organizations. For example, our Environmental Health Science students have greatly benefited from a Student Environmental Health Practitioner Mentoring program that's held each year, at the annual Texas Environmental Health Association meeting. Environmental health students are partnered with seasoned environmental health practitioners in a buddy system. This provides another opportunity for students to learn directly from experienced professionals. The students are interested in securing internships, and the professionals are often interested in recruiting new staff, so it's a win-win.

**[00:11:52.800] - Dr. Bryan Brooks**

For early career professionals, I highly recommend volunteering with your professional organizations, such as the state affiliates of the National Environmental Health Association, the National Environmental Health Association itself, the Society of Toxicology, the Society of Environmental Toxicology and Chemistry, or the American Chemical Society, just to name a few. These nonprofits depend upon your volunteerism, and you'll expand your professional network and reap the benefits while connecting with other mentors in the process.

**[00:12:23.320] - EH Nexus Host**

Thank you, Dr. Brian Brooks, for sharing your insights and experiences with us today. And to our listeners, thank you in to this episode of the EH Nexus podcast. Be sure to join us for our upcoming episodes, where we'll continue to explore key topics in environmental health.