



From Swine Lagoons to Space and Back Again

Mr. Bill Cumbie

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Water is essential for life. It is the major component of virtually all creatures and its abundance on earth is one of the major reasons life can thrive on earth. We use it for travel, for recreation, for growing crops, and it plays a part in many aspects of our life. Water connects everything and we must recognize that interconnectedness if we are to have a clear vision of how to enjoy and preserve this resource.

We will start by discussing the challenges of supplying water for astronauts in space. Then we will discuss the science of biological wastewater recycling including the research we at Pancopia are pursuing using anammox, a recently discovered bacterium that can more than halve the cost of nitrogen removal from wastewater.

We will look at how 'earth bound' systems and technologies can help resolve issues in space and how solutions to problems in space can improve systems on earth. We will explore how research from one field can be applied in another and how this paradigm has played out the research that NASA has sponsored.

Bill Cumbie, PE is the founder and Chief Executive Officer of Pancopia, Inc., a research, development, and commercialization firm specializing in the identification and introduction of environmental technologies that transform wastewater from a liability to a productive asset.

Bill has forty years' experience in water purification and reuse. He received his Civil Engineering degree from Old Dominion University and a Master's in Sanitary Engineering from Virginia Tech. He is a registered professional engineer in Virginia with experience as a Plant Manager at Hampton Roads Sanitation District.

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