

IISD Water Gala 2015 Keynote Speech

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When I was a kid I had the good fortune to have a fabulous biology teacher who ignited my interest in biodiversity before the word even existed. The course started with blue green algae and ended with mammals, with all other parts of biology hung on in appropriate places. So before I was 15, I understood the outline of life on Earth -- what today we call biodiversity, and I have never been able to get enough of it ever since.

And life requires water, and the biodiversity-water connection is hugely meaningful as I will detail. All of which means a Water Gala to celebrate the Experimental Lake Area is important, indeed.

Twenty-five years ago when I took some Hollywood star power to the Amazon, a Hollywood agent attached himself to the group hoping to drum up some business. In contrast to the stars, he wasn't the least interested in the environment or the Amazon. Noting the kilometer markers going by on the road to my Amazon camp, he asked what they were. When told they were kilometer markers, he said "Oh, one every mile?".

That is a silly way to make the point of how important ecological signposts really are. The 45 year data set of the Experimental Lakes area is highly significant and the International Institute for Sustainable Development deserves great accolades for having rescued that data set from peremptory mindless termination.

I should reveal that my PhD Advisor was G. Evelyn Hutchinson, the founder of modern ecology, who was equally famous for his work in freshwater ecology as well as theoretical ecology. Hutchinson never attempted a PhD because Cambridge would not permit a dissertation which combined physics, geology, chemistry and biology. In South Africa for a year in his early twenties, those all came together for Hutchinson, when he started studying shallow pan lakes called Vleis. That led among other things to his phenomenal Treatise on Limnology (freshwater ecology) which is a cornerstone of that branch of knowledge.

His good friend and colleague Ruth Patrick (who died only two years ago at 105) published an incredibly important paper in 1946 in which she demonstrated that the number and kinds of species in a stream or river, reflected not only the natural conditions (geology, chemistry, physics and biology) , but also the stresses human activity put on a watershed. In other words biodiversity provides a read-out of the state of the environment - for the very simple reason that all environmental "problems" affect living systems. In other words, biodiversity integrates all environmental problems. Ruth Patrick's approach has come to be called "The Patrick Principle" and, among other things, is at the heart of water regulation at the United States Environmental Protection Agency.

The Planetary Boundaries diagram published in Nature by Johan Rockstrom et al. in 2009 shows the Patrick Principle at the level of the entire planet. At the center of a spiderweb-like diagram is a green area which represents the conditions that nourished the rise of civilization and represents "safe operating space" for humanity.

In the 2009 version there are three aspects with sufficient data to show "excursions" beyond the safe zone. One of them is nitrogen because there is now twice as much biologically active nitrogen as occurs naturally. It manifests itself in dead zones in estuaries and coastal waters worldwide. They have doubled in number every ten years for the past four decades.



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