How to Tackle the Most Critical Environmental Issues of 2013

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Dr. Lisa J. Graumlich is the inaugural Dean of the College of the Environment at the University of Washington. As Dean, she leads a College with unparalleled depth and breadth in environmental systems: from the forests to the seas and from the depths of the earth to the edges of the solar system. As a scholar, Graumlich pioneered the use of tree-ring data to understand long-term trends in climate, focusing on the mountains of western North America.

I got my first sense of environmental science as a child growing up in Toledo, Ohio. Located on the shores of Lake Erie, Toledo has a number of beaches. But we never spent any time near the sand -- because Lake Erie was the largest dying body of water in the world, and the beach was toxic.

That said, my family was happy they weren't in Cleveland, where the Cuyahoga River spontaneously combusted.

The water quality has improved substantially in Lake Erie and the Cuyahoga, thanks to what some people call the "3 S's" -- the problems were simple; there was a "sinner"; and there was an easily identifiable solution.

But unlike these 20th century environmental problems that we faced back in Ohio during my childhood, the sustainability issues we confront today are incredibly large and complicated.

Indeed, the environmental challenges of 2013 are hardly simple or one dimensional; the "sinners" are many (all of us, in some cases); and the solutions are often highly complex.

When you think about saving Puget Sound in the 21st century, for example, it's not like you can find a single answer that will automatically extend its precious life.

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To be perfectly honest, these issues are just too big for one person or one lab to solve. The days of the one person, the "hero," who will save us all through research or advocacy are long over.

Instead, we must rely on teams of excellent scientists doing cutting-edge research. They provide the base from which we can assess trade-offs while looking for solutions that embrace the full complexity of the environmental systems we live and work in today.

More specifically, large-scale challenges like climate change or ocean acidification require visionary thinking and collaborative scientific work that spans a variety of fields and disciplines.

And that's one of the reasons why the College of the Environment at the University of Washington was founded.

We approach environmental problems from a multi-dimensional point of view, and we try to think about the full complexity of these issues, pulling connections and expertise from a variety of sources.

We also give students opportunities to engage in research individually, and on interdisciplinary teams, working side-by-side with faculty and other professionals to address significant real-world research and application problems.

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Finally, we create the capacity for students to learn from each other. Making sure they can partner across disciplines and skill sets while they're at the College of the Environment will help them succeed as young professionals at a host of different organizations and institutions upon graduation.

This interdisciplinary approach -- which could include an earth sciences faculty member, engineer, business student, and a historian all working together -- is very different from the way things worked in the past.

We continue to rely and build upon the same kind of deep, fundamental science that have always served as the foundation of our various disciplines, from oceanography to atmospheric sciences. Now we build multi-disciplinary structures on those foundations that allow us to explore challenges of incredible scale and complexity.

And, in addition to fostering peer-to-peer and faculty-to-student learning, these teams require their members to reframe their questions in order to find hugely important solutions.

The learning also requires an ability to do the science -- both in the research lab and in the experiential field.

In recent years, our students have been able to work off-campus in teams in an effort to solve significant environmental problems.

One of our young atmospheric scientists, for example, helped the city of Bellevue, near Seattle, create a carbon management plan. A fisheries student collaborated with the Seattle Restaurant Association on a guide for sustainable fish sources. And a number of students are involved with a group that is developing processes to convert fast-growing trees into biofuels.

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In the end, whenever I'm asked how we educate and nurture the sustainability leaders of tomorrow, I usually respond by talking about the importance of multi-disciplinary teams. Joining together in cutting-edge research or real-world projects is the only way we can effectively and efficiently tackle the critical challenges facing our planet in the 21st century.