

## President's Message: Explain Yourself

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I don't know about you, but to me the world in which we live appears to be faster and more full of information than in years past. The pace of information being provided to us is increased by modern conveniences like television and the Internet. While it is amazing the speed with which we can receive information, I am concerned that the information is not getting processed properly. In some cases, I am convinced that the information provided is faulty.

As we are inundated with messages, news stories, and opinions, there are many who cannot discern fact from fiction. With this flood of information, knowledge is not keeping pace. Take, for example, news reporting. In the present-day need to be first to break a story, there is little critical investigation to discover all aspects of the story. The drive to get the story on air means that reporting often contains misinformation and sensationalism. Add to this the proliferation of independent bloggers who provide their information with no oversight or fact checking, and the stage is set for tremendous factual inaccuracy.

Because the flow of information is so fast and the subjects of reports are so varied, the public as a whole has little or no time to research a story. In many cases, people have no choice than to accept what has been reported or opined as the truth. Or, more cynically, portions of the public look for news that agrees with their specific worldview and look no further. With the advent of the Internet, this particular aspect of selective learning has become more apparent and more disconcerting. Additionally, there appears to be a need to keep issues in the realm of black and white. For many, there is no gray, no nuance, no shading that includes alternate considerations or information. Personally, I believe most scientists exist in the grayness; it keeps our minds open.

The recent concept of a filter bubble was brought to my attention by a member of

the Board (Pariser, 2011). In this controversial concept, developed by Eli Pariser, the phenomenon is explained wherein Internet search queries selectively guess what information a user would like to see based on the user's past search history. As a result, searches tend to play back information that agrees with the user's past viewpoint. According to Pariser, users are afforded less exposure to conflicting viewpoints and are isolated intellectually in their own informational bubble.

I want to be fair about this; the political leaning of a person has no direct relationship to this paradigm. Using the polarizing images of left and right does not eliminate the blatant use of misinformation in the pursuit of an agenda. I have made conscious decisions not to join or support environmentally based organizations when I discovered the same exaggeration of fact and ignoring of nuance to make a point in their favor.

A recent article I read provided a simple message for us to consider. The speaker, Christopher Reddy, is a scientist at Woods Hole Oceanographic Institution. When he was interviewed about his work on the Deepwater Horizon incident, he said citizens should try to distinguish between environmentalists, who have a public policy mission, and environmental scientists, who have a mission to find and present the facts, regardless of the policy or political implications (Whitcomb, 2011).

Reddy's point is well made. This is an important distinction that we all need to recognize. There is no right or left to the levels of misinformation and agenda being reported to the public. The misrepresentation of science and facts, no matter who is doing it, lacks the basic tenants of ethical behavior. Science is supposed to report the facts and not be bought, not be influenced by the source of funding, not beholden to the benefactors of specific research.

I am involved in the National Association of Environmental Professionals (NAEP) because our mission and our ethics clearly require us to provide facts and education to our members and the environmental professions. We have a membership that is well informed and concerned. I have re-

ceived criticism from members who wanted specific policy statements from NAEP supporting or opposing issues of concern to them. At times, I agree with the criticism.

It is not that we do not want to get involved. In some cases, we are unaware of the issue. It is either of local interest, or it is within a smaller subject matter of specific interest to the particular member. I do not know of any time where we were made aware of a specific issue where we have declined to consider comment if it affected the environmental professions or environmental professionals. We were certainly made aware of National Environmental Policy Act (NEPA) and Endangered Species Act concerns in the recent past and provided expert testimony to the Congress about the NAEP stand regarding possible actions affecting both laws. We became aware because our membership was active and involved through the NEPA Working Group and the Energy and Environmental Policy Committee.

Our members have written and continue to write many important books. Through the volunteer commitment of members, our committees and working groups have authored white papers on energy policy and peak oil. It is hard to keep up with many of the important contributions to the professions that are completed by our membership. NAEP cares and wants to be involved in issues of this import.

In other cases, we do not agree with the stand being taken. Where we have declined to make statements, the reluctance has come from a concern that the correct application of science was not implemented when the issue was initially formed.

A few years ago, NAEP was approached to back state legislation concerning the banning of plastic shopping bags. On the surface, the issue was pretty cut and dry. However, once we read further into the information used to support the issue, a decision was made that we could not support the legislation. It would have been an ethical violation for NAEP to become a sponsor or signatory.

The supporting literature proclaimed that plastic shopping bags were killing tens of thousands of sea turtles each year. I do not

dispute the possibility that floating shopping bags can resemble jellyfish, a staple of several species. The claim of the loss of tens of thousands of sea turtles was where the facts were abandoned for agenda. While it is not a stretch to say that the basic premise was based in fact, the numbers being claimed were unattributed and inflated to achieve a specific outcome, to address emotion, not to represent scientific fact. It was felt that the claim of injury was inaccurate and supplied misinformation to the public. Attaching the name and reputation of NAEP would not have been right.

A recent article published in the *NAEP E-News* provided a better consideration of the question (Campbell and Watson, 2011). The authors looked at the issue under the microscope of scientific method and policy to help develop a workable and defensible ordinance to ban plastic shopping bags. The decision was based on verifiable factual information.

Then there is the ongoing political fight concerning global climate change. While the initial phenomenon described was titled as *global warming*, the more that was discovered the more precise the term *global climate change* became. Yet, opponents still denigrate the known aspects of climate change when a snowstorm brings eastern cities to a halt.

The main problem, other than the deliberate obfuscation of the issue by misrepresentation, is that opponents interpret and describe local weather patterns to represent the global climate. An unsophisticated audience can be easily misled. Through the use of unconfirmed scientific claims, opponents state with certainty that things like the return of winter's seasonal polar ice refutes global warming. The lack of summer ice, the relative thinness of the winter ice, and the later appearance of a winter ice field are ignored. Through the selective reporting of winter conditions, the intent is to use verbal sleight of hand to control the message.

In many cases, the public is not provided a true representation of conditions, a true exchange of ideas. Unfounded claims of "thousands of scientists" who do not agree with global climate change do not change

the fact that a predominance of scientific research aimed at determining the existence or absence of global climate change (use of the basic scientific method of a null hypothesis) is continually confirming the existence and progression of climate change.

Tornadoes in New England, tropical storms and hurricanes forming close to and impacting the Canadian Maritime Provinces, and early May and December tropical weather systems (for example, the 2007 hurricane season) appear to be observable proof that is being presented as a harbinger of global warming. An article today discussed the increasing size and amount of jellyfish in the world's oceans and that jellyfish are being found in areas once thought to have waters too cold for their proliferation.

By slanting the message to include the idea that what we are seeing is a cyclic, normal climatic change, the opponents to human-induced climate change further cloud the issue that most research points to a human origin for the extremes being seen. The climate change patterns, including the northern progression of plant species into areas previously beyond their range, do not definitely refute cyclic change; however, the added complexity and grayness come with the human impact aspect in this particular cycle.

A result of the effort to frame environmental issues in an all-or-nothing context means that the effort to disprove a human-caused source for climate change keeps much of the population ignorant or unwilling to participate in the obvious personal benefits of pursuing energy conservation in favor of continued unsustainable development of petroleum-based energy.

By conserving energy, the population and the country can conserve our personal and government finances and be a part of an attempt to improve the greater good.

Here is the grayness. Whether we can make changes that will remove climate change or not, conservation of resources could result in a cleaner environment (air, water, and land). The matter of whether climate change is related to cyclic phenomenon is actually a side issue. By injecting specific

agenda items into the discussion, the science is muted and the ambient noise of political misdirection makes the benefits harder to accept for some.

I had a professor in my undergraduate education who stated that all progress comes from the lunatic fringe. On its face, the claim seemed preposterous. However, would we still be looking at the earth as flat if the lunatic fringe had not suggested that the world was round? Would we understand space travel without the lunatics who stepped out and stated, based on their research, that the earth was not the center of the universe? Would we still be plagued by measles and polio if the idea of using the virus against itself had not been considered?

Extending the thesis here a bit, however, the lunatic fringe can have a negative impact on us, as well. In 2004, a scientist claimed that vaccinations had a direct link to autism. His claim was even published in a respected medical journal. That report was eventually proven false, but the news cycle had already done its damage.

Eventually, other researchers examined the science behind the claim and tried to reproduce the results (another aspect of the scientific method). Had the normal scientific methodology taken hold, the eventual debunking of the claim would have resulted in a final determination that would have ended the claim. However, in the age of fast news reporting, unattributed sources, and unbridled opinion, this flawed research has turned into a movement in this and many countries where new parents are avoiding immunization. There is now a portion of the public that still believes the connection, and some childhood diseases once thought to be on the brink of eradication have returned. The immediacy of the news beast is part of the modern age. The lack of critical thinking and need to beat the competition could lead to a resurgence of childhood diseases that were once nearly wiped out.

Clearly, science is in need of defense; it requires better explanation. We, as thinking and working professional scientists need to help reeducate the world. It is my belief that worldview can clearly be shaped by concerned professionals.

What this message is, I hope, is a call to the membership and any environmental professional reading this to become involved, to work hard to explain yourself. Help educate the public about the real environmental and scientific facts. I am not asking that you become a national spokesperson, *per se*. Start small, in your community, in your educational systems.

I know that we feel we are following the correct path and need not spend our time reaching out to those who do not appear to want to understand science in all of its imperfections and seeming contradictions. At times, I am inclined to agree with that assessment. However, a larger population is getting either a poor education or none when it comes to scientific thinking. My call is for professionals to get involved.

A member recently gave me a letter from the American Association for the Advancement of Science and 18 other scientific organizations to the School Board of Los Alamitos, California. The premise of the letter was that the debate on global climate change was being treated in the district as a controversial topic. Thus, the district was teaching climate change in light of competing theories.

The conclusion of the letter is an important one: "As the students of Los Alamitos graduate and enter the global workforce, a sound understanding of science and technology will be critical to their ability to compete for high-skill jobs in an increasingly high-tech world economy. Asserting that there are scientific controversies about these concepts among researchers—when in fact there are not—will only confuse students, not enlighten them."

The member wanted to know why NAEP was not a signatory, why we were not more involved in issues of this nature. I really do not have an answer other than somehow our membership is missing opportunities to meet the mission of NAEP. In this instance, I believe NAEP would have been right to be a signatory.

The mission of NAEP, and I will paraphrase here, is to be an interdisciplinary organization dedicated to developing the highest standards of ethics and proficiency

in the environmental professions. Our vision includes the idea that we should encourage better decision making that thoughtfully considers the full implications of those decisions.

My feeling is that the curriculum of a state or a specific school district, when it comes to science, should be based on sound, well-informed decisions. The inclusion of anything in the science curriculum that hinders the potential future of our young scientists is wrong. Further, I believe it is incumbent on us as environmental professionals to be a part of ensuring that the curriculum taught at the K–12 grades is of the best quality that can be provided.

When we still have entire states and school districts teaching evolution as "another" explanation of the origin of species, we are doing our students a grave disservice. A recent statistic I saw made me flinch: one in four teachers do not believe evolution is true. As scientists, we have allowed the teaching of our future scientists fall into the hands of a political agenda that will harm their chances in an ever-increasing worldwide job market.

What can you do? Get involved in the local affairs of your school district. Explain yourself so you can be heard above the din of misinformation. Get involved in the development of your state curriculum. If you can, be a part of those who review and approve textbooks and other teaching materials for young students.

This past February, I participated in the review of texts for the Florida State curriculum in environmental science and earth science for grades 9–12. Reviewing 14 textbooks was a lot of work, but by the end of it I was better informed on new developments and better grounded in basic knowledge, which enabled me to contribute well to the scientific curriculum for the next six years in the entire state.

For the past six years, I have been involved in judging science fairs in my county in Florida. This year, I funded and distributed a NAEP award for the senior division. I have been involved in a program titled I LOVE Science (<http://ilovescience.ihmc.us>), where environmental professionals pro-

vide monthly hands-on scientific exposure to fifth-grade students to encourage their appreciation of the excitement of science. This program was one of amazing cooperation between inspired politicians, committed scientists, and community-involved industrial partners.

What is most surprising about this program is that it was conceptualized and sponsored by a sitting politician, not a scientist. Then state representative Holly Benson and Dr. Megan Pratt understood the importance of a good scientific education and realized that the best way to keep children on the path to continued learning was to expose them to real people who do science daily. What they might not have expected was the rewards obtained by the participating professionals. Visionary politicians can appear to be rare, but they exist.

This was not an isolated effort of these two women. Their efforts were fully supported in the area, which was the key to final success. Gulf Power, the regional power company, provided sponsorship and support to ensure that the program became workable. The Institute of Human and Machine Cognition, a research facility associated with the University of West Florida, and the school boards of Escambia and Santa Rosa Counties all cooperated in this amazing program. Today, Dr. Pratt continues to devote time and effort to this program. The program still reaches 250 classrooms in the two-county area.

Finally, my wife, Debbie, and I have developed and conducted a field ecology exercise in coastal systems for the local International Baccalaureate program. We have provided not only student education for the past five years, but a means for local professionals to join in the effort to excite students about science. The best review I heard was a young woman's comment: "This is fun. I want to be a botanist." I felt we were accomplishing our goals. These are only a few of the many opportunities you can either join in locally or develop in your school districts.

Our kids need you to get involved in student activities and field exercises that help them understand that there is more to their adult life than computer games, Facebook,

Twitter, and Web design. The study of the environment is a large and amazing profession to choose. It brings us close to the world we live in. It really is the hope for our future.

This effort to explain ourselves is part of what we are called to do to prevent the loss of scientific preeminence that our students have enjoyed for many years. The lead is slipping and, in some instances, is com-

promised. However, it is not too late. It really is a responsibility we hold to pay future generations for what we have gained. We cannot lose the scientific education of future generations to the uninformed and politically compromised.

## References

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