ENVIRONMENTALLY SPEAKING

Peter Schwartzman

Environmental myths scrutinized

Given the contentious nature of many environmental controversies, it is no surprise that many environmental myths exist and circulate. Many factors allow these myths to survive and spread. Some of these elements are expected, such as a retelling of an incident where details get garbled. Others are regrettable, but understandable, oversights, such as the lack of ecological or climatological components in our educational programs, K-12 and beyond. Yet still others appear much more deliberate, such as the misrepresentation of relevant findings when political or economic pressures encourage a smearing of the truth. Whatever the reasons that myths prevail, it is important for conscientious citizenry to step through the hurdles and cobwebs in the search of reality.

Many of the myths or misunderstandings below will appear extremely innocuous but a closer look reveals that individually, or collectively, they indicate a more serious situation, particularly if they are successful in promoting inappropriate action/inaction, ambivalence, or indifference. The better we clarify potential confusions, the less likely the public can use the excuse of "conflicting evidence" as reason for delayed response. Additionally, the better informed the public is, the better it will be able to participate in a meaningful way in the democratic process, something central to the success of our government and its institutions.

Myth #1: *Snow results in cold conditions.*

Snow does make things cold but actually it also makes some things warm. Huh? And this "warming" has profound effects on our lives. Thus, if the annual snow amount or the duration of its coverage is altered because of climate change, our lives may be unavoidably modified in adverse ways.

In atmospheric pressures common to our surroundings, snow must be at or below freezing. Thus, when snow stays on the ground, it chills the ground below as well as the air above. Snow also reflects sunlight more readily than most naturally found materials. And since reflection results in sunlight being directed back out to space, where it can no longer warm the Earth, snow again causes a colder environment. But this is only part of the story. In climates where winter temperatures rarely sneak above the freezing point, snow actually keeps the ground, and consequently, the soil, warm (here warm meaning at or above freezing) which allows many biological processes to continue, even during the heart of winter. And given that these processes are so important to the returning of nutrients to the soil, the snow that we receive actually helps maintain the rich and prosperous soils of the Midwest. It also makes for a beautiful spring and summer by preserving bulbs during the frigid months. So next time you see snow, don't forget to envision healthy farms and gardens resplendent with wildflowers. Also, don't so readily dismiss the importance of snow cover and the potential threat caused by climate change via a possible reduction in its extent and duration.

Myth #2: *Only about 1,000 animals in the world are currently in jeopardy of extinction.*

The Endangered Species Act, signed into U.S. law in 1973, is one of the most powerful environmental laws that we have (despite recent attacks to weaken it). Currently, 1504 species worldwide (60% of which are animals) have been listed as endangered and currently are protected under the law; another 317 are classified as threatened. And given that taxonomists have classified over 1.5 million species, it would appear that the vast majority of species are living peacefully and in no danger of extermination. Unfortunately, this is just another case where a few selected numbers tell only a small part of a much larger story. In actuality, too many of the world's species are in dire straights.

The roughly one thousand species protected by the Endangered Species Act (ESA) represent only a pittance of the species that are in grave danger. Of the estimated 30 million species that inhabit the world, it is projected that more than 10,000 (and perhaps as many as 100,000) species will be lost forever, this year alone. How many of these species are on the Endangered Species List? Probably none. How can this be? Well, given that we have identified less than 10% of the world's species, it isn't at all surprising that the species that we are losing are ones that we don't know much about. Additionally, given that larger species (such as the giant panda or the Siberian tiger) get the bulk of our attention, and therefore protection, little time remains for the consideration of (or care for) other, less prominent species. And lastly, given that most of the loss of species is taking place in the tropics far removed from the watchful eyes of the U.S. Fish and Wildlife Service, the organization largely responsible for carrying out the ESA, almost all the eradicated species go unnoticed, at least by the public and our government's bureaucrats.

While the true numbers of exterminations are horrific, might even 1,504 be too many as well; especially when we believe that prior to humans, species of mammals and birds were only lost at the rate of one per every thousand years, not the current one per year?

Myth #3: *Fahrenheit Temperature is always larger than Celsius Temperature.*

The U.S. and Jamaica are the only two countries left using degrees Fahrenheit as units for temperature. Anyone that has traveled to another country knows, the numeric value for temperature when given in °F is larger than when given in °C. Alas, this is true for most climates on Earth, however, negative 40°F is equivalent to negative 40°C and -60°F is numerically less than its equivalent of -51°C. You see, each incremental change of 1 °F is substantially smaller than each incremental change of 1°C (actually it is 45% smaller). But who cares? Well, in climate change circles, when scientific bodies produce reports that give projected temperature change in both °F and °C and when U.S. broadcasts don't properly give attention to this difference, the citizens are predisposed to confuse the results. In this confusion, some reject the evidence as not scientifically credible because of the "false" appearance of uncertainty and inconsistency. While there is a good deal of uncertainty in the absolute amount of warming that is expected, nearly all climate models predict future warming (°F and °C) due to enhancements in greenhouse gas concentrations.

Myth #4: *The sheer number of humans on the Earth is the key factor in environmental destruction.*

Many people believe this, even a substantial number of environmentalists (particularly those that uncritically read Paul Ehrlich's *Population Bomb* in1968 and *Population Explosion* in 1991). Unfortunately, my work has convinced me that this is one of the most damaging myths. It is definitely true that all humans require resources to survive and all humans produce wastes as a function of living. And it is also true, that in many parts of the world, increasing populations have meant that resources are extracted and waste produced at a rate that local environments cannot absorb with being denigrated. However, there are many other places on the globe that seemingly have too many people (per area), such as The Netherlands, Singapore, and Taiwan, yet they don't suffer to the nearly the same extent as other, poorer, nations with smaller population densities. So, population cannot be the only, or even perhaps the major, factor causing the destruction of global environments.

The factor that seems to trump population in terms of environmental damage is affluence, or the level of resource use and waste production. It turns out that the average Westerner uses resources (such as water, soil, metal, plastic, etc.) to a much greater extent than the majority of the world's citizens. And, where do you think many of these resources come from? That's right, the "over-populated" countries of the world. In this way, the burden and consequent damage to the environments of the world's developing countries is due in large part to the needs of the richer nations of the world. Population size and growth rate isn't irrelevant but it often pales in comparative influence as it concerns the environment. And the reason why this myth is so counterproductive (and even pernicious) is because it allows those people in the developed world (the vast majority of people reading this article) to blame others for current environmental calamities rather than themselves. We all seem to have the natural tendency to blame others rather than ourselves, and this is probably why this myth is so appealing and well-established. Perhaps a reevaluation of the relative impacts on environmental damage will have us reconceptualize and come to terms with the role that each of us plays in current and future destruction.

Myth #5: *Clear skies make for warm days and cloudy skies make for cold ones.*

It all depends on the time of the year. In summer, cloudy daytimes are usually cooler than clear ones, but cloudy nights are generally warmer than clear ones. The latter is true because a clear sky allows the Earth to cool off much more readily. During the winter, clear skies, especially in the Midwest, are often associated with high pressure systems which tend to contain frigid polar air and thus are colder than usual. Evening winters are influenced by clouds in a similar fashion as summer, i.e., cloudiness leads to warming.

Having said all of this, actual conditions can be radically influenced by the presence of water (in the lower atmosphere or on the ground). As a ground cools during the evening, if it reaches the critical temperature known as dewpoint, dew will form at the surface. Dew formation is an exothermic process, meaning that it releases energy into the system, keeping the temperature from dropping any further. But, with the coming of dawn, the burning off of dew or standing water requires energy. Thus, solar heat that would otherwise serve as a warming agent has limited influence on temperature (at least as long as the water remains). Yet, how important are these understandings?

The myth about clear and cloudy skies is important because it suggests that simple intuition can be very misleading. As more and more details (such as time of day, season, dew, etc.) are considered, a broad statement about the role of clouds in the heating or cooling of the Earth becomes improper. In short, simplicity must give way to fuller understanding. This maxim is true in most environmental conversations yet it is too often forgotten. Perhaps a clarification of the above myth will serve as a reminder to be skeptical of overly simplistic statements or casual dismissals about our natural world.

Myth #6: *Bottled water is safer than tap water.*

How many of us purchase bottled water on a regular basis? News reports suggest that more and more of us are doing this with increasing frequency. But why? It is just a matter of convenience or do we expect to get a better product. Actually, there is more reason to question the quality of bottled water than most sources of tap water. Municipal water is much more closely regulated for one. Government providers of tap water must routinely test for an assortment of chemicals and the presence of dangerous microbes.

The convenience argument may make sense at first, but when one considers how much more expensive bottled water is than tap water (on the order of one-thousand times more costly), our convenience seems more like arrogance or ignorance. With this knowledge in mind, perhaps we can return to the day that a pitcher of local tap water was considered healthy, refreshing and adequate. What do we have to gain from a tweaking of our perspective? A great deal: local usage, reduced waste (from plastic bottles and fossils fuels used to transport distant waters), reduced internal consumption of plastic residues (that leach from bottles), and a tremendous amount of money.

Myth #7: *Slavery has been eradicated.*

Absolutely not. An article published in Scientific American early last year claims that there are an estimated 27 million people enslaved in the world today; this works out to 4 in every 1,000 of us. According to Kevin Bales, a sociologist at the University of Surrey Roehampton in London, this unbelievably large number of people is properly considered slaves (not just exploited humans), because not only are they forced to work for essentially no pay, they have virtually no ability to change their position. Although all countries have made slavery illegal, weak rules of law combined with profiteers willing to sell humans, often children, make slavery a lucrative and widespread business even in 2003. Not only are the victims of this oppression treated in ways that are unimaginable, worse, their exposure to the horror "brings about a psychological degradation that often renders [them] unable to function in the outside world." Amazingly, some slaves are convinced that they were always meant to be slaves, largely due to psychological manipulation by their owners.

While most of the slaves are found in Asia (some twenty-two million in India alone, *where heredity debt bondage persists in* some communities), Dr. Bales estimates that even today there are more than one-hundred thousand in the United States and a comparable number in Europe. Clearly, slavery is still an institution will a tremendous number of advocates and supporters.

But, as horrible as this sounds, why is this an environmental myth? Environmentally-minded people as well as environmentally challenged people both suffer from a false sense of security as it pertains to the treatment of our fellow humans. If we can come to terms that the widespread horror of slavery still persists, we might be more willing to give environmental catastrophists, those environmentalists that speak about a present or impeding doom related to environmental health and vitality, a fairer hearing. In other words, if so many humans can still be treated so harshly and without our knowledge, why is it so hard to believe that non-human life is likely treated in similar ways or that ecosystems might be driven to near collapse by human activities. Perhaps incredulity won't be as widespread once we come to terms with some of the misfortunes that humanity has created and continues to perpetuate largely due to immorality, greed combined with ignorance and disbelief.

The seven myths discussed here nowhere near represent the hordes that exist. However, a recognition of them begins to dispel the false conclusions they often engender. All of us need to tackle these, and remaining myths, if we expect our populace to be properly informed when it comes to the ballot box and the charity coffers, two things that definitely impact the direction our nation takes concerning the environmental challenges that we face.

Peter Schwartzman, a resident of Galesburg, is chair of the Environmental Studies Program at Knox College. He is a research climatologist with peer-reviewed publications in the area of climate change and human population growth and he is currently writing two books focused on bringing environmental understanding to a wider audience.