

One planet—Earth. How is it doing?

Author's note: Two years ago this month, when I began writing this monthly column for The Zephyr, I had no idea where this commitment would take me. Along the way I have been inspired by readers as well as my students to pursue inquiry into a variety of topics—including lead, radon, water, transportation, diet, consumption, etc. Before taking a snapshot of our planet's health, let me thank all of you for your comments and critiques—I certainly have learned much from them. I look forward to future reactions and new avenues of research.

Humans have long looked to the sky and dreamed of space exploration and finding other planets in far-away galaxies that harbor life. Recently, in response to a growing recognition that resources are finite, some have considered distant planets viable supply stations when earthly resources run out. Supposedly, these foreign reserves will allow humans to maintain current, and even expanded, material standards. Despite these longings, energy and time constraints make large-scale intergalactic space travel something well beyond our life spans; it takes a huge amount of energy to get a space ship beyond the Earth's gravitation field and the nearest livable planet is likely hundreds if not thousands of years away. Thus, pipe dreams aside, for all-intents-and-purposes we are stuck here on Earth and therefore entirely reliant on it (and the Sun's radiation) for our energy, food, and materials. If we resign ourselves to the fact that we are bound to Earth for at least the next dozen generations, we might begin to recognize that we'd better give earthly matters our primary attention.

Once a decision has been made to stick to Earth, the challenge has just begun. Where do we start? Well, as a doctor might say to a patient, "let's determine your health before we begin to seek remedies." Getting a global sense of the health of the Earth and its inhabitants definitely requires a thoughtful, creative, and dynamic assessment. And albeit difficult to accomplish, such an assessment would necessarily bring many folks together from a broad spectrum of backgrounds and specialties. Not only would such an assessment require a commitment from many sectors of our society, but it would also necessitate global rather than national involvement. However, not to be dissuaded by the complexity and difficulty of the task, many environmental scientists have begun to tackle this question.

The questions that these scientists seek answers to and the variables they measure and quantify are certainly many. As such, it may be instructive to think of them as broken down into two distinct categories—those centered on humans and those centered on other biological organisms. Human-centered variables focus on population, longevity, prevalence of disease and access to food, water, energy

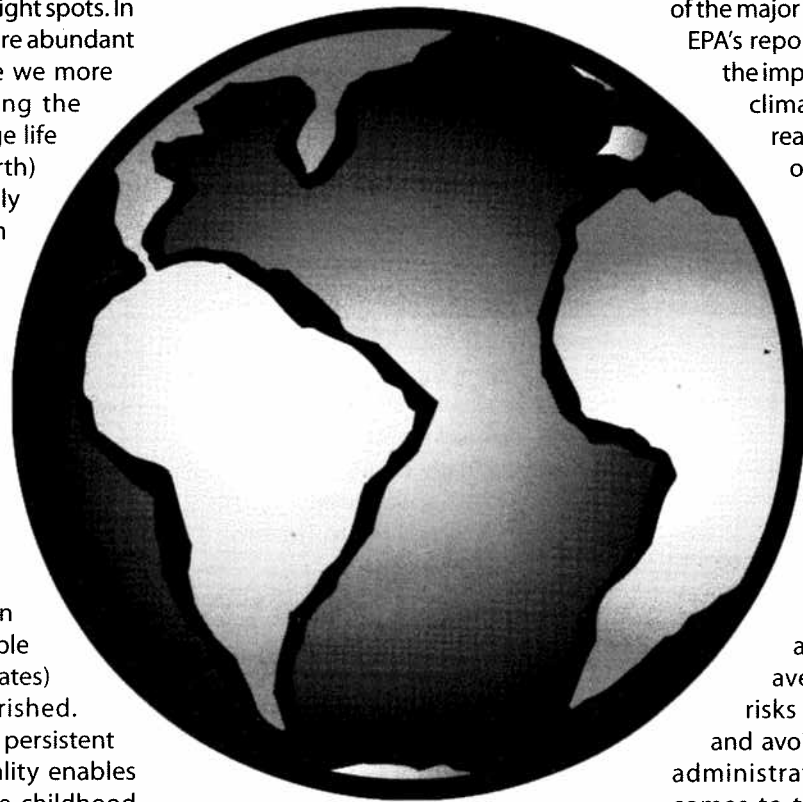
and other necessities. Biologically-focused variables relate to viability and diversity of species and ecosystems. The goal is to assess these variables and establish their past, present and future values. A look at some of these variables will provide a snapshot of the current health of our planet.

Concerning humans, there are bright spots as well as some not-so-bright spots. In terms of population, we are more abundant than we have ever been since we more than tripled in number during the 20th century alone. The average life expectancy of humans (at birth) has also increased dramatically over the past 100 years, from something in the mid-30s to a current value of about 67 years (World Bank). However, in many countries, such as Sierra Leone, Niger, and Malawi (all in Africa) the life expectancy is still below 30 years. While more people on the Earth have access to adequate nutrients now than in the past, nearly a billion people (a number more than three times the number of people currently living in the United States) are still chronically malnourished.

Access to clean water is still a persistent problem and poor water quality enables large numbers of preventable childhood diseases to flourish. Yet while food and clean water are scarce in the world, largely for political reasons, nationally there is nearly one television set for every resident (804 T.V.'s per thousand people as of 1995), and globally more than a half a billion automobiles clog our highways and intersections (Vital Signs). In sum, a human-based review provides mixed-bag of results with some bizarre priorities added on.

Biologically speaking, current trends represent bleak futures. Efforts to protect ecosystems from unfettered industrialization notwithstanding, huge swaths of tropical forests have been eliminated by deliberate, yet irresponsible, uses of chain saws or matches—purposely lit to raze large tracts of forest for ranching or plantation agriculture. Species losses are more dramatic now than they have been in the entire history of humankind. It is true that a few species, such as the whooping crane and the California condor (sometimes called "charismatic" species because they tend to appeal to our senses), have been spared extinction, at least in the short-run. But a broader examination establishes that human land use has exterminated tens of thousands of species already with many more thousands (or millions) expected on the horizon. Some megafauna, according to the World Conservation Union, including the African black rhino, the Javan rhino and the Sumatran rhino, are in critical positions largely because

human populations are either hunting them outright or encroaching on their remaining habitat. According to world renowned oceanographer, Dr. Sylvia Earle, some less publicized species, such as the leatherback sea turtle, the white abalone, and the North Atlantic right whale, also face very serious challenges due to human incursions into



ocean environments (Earle). Short lists of names such as these are always misleading because in reality thousands of other species, most that have never even been named, are being lost every year due to human activities. At the ecosystem level, coral reefs and wetlands also show signs of tremendous stress and failure. In sum, the ecological picture has many dark spots.

As striking as the above information might seem, our current government doesn't seem to think things are going so badly. Just one month ago, the Environmental Protection Agency released a substantial report on the health of our environment; go to <http://www.epa.gov/indicators/roe/html/roeTOC.htm> to download report 167 pages in length. Entitled the "Draft Report on the Environment," this "unprecedented" (to borrow the government's language) effort to document the state of the U.S. environment concludes several things that may surprise many people, including: (1) air pollution is down 25% since 1970 despite increases in population and miles traveled; (2) drinking water is safer, driven by a 15% increase in the percentage of residents that have access to clean water resources; (3) toxic chemical releases are down considerably (48% since 1988); and, (4) public health is improving as indicated by increases in longevity and reductions in infant mortality. The report doesn't just highlight positive trends but also acknowledges that more needs to be done, particularly in the areas of improved air quality (over 45% of the U.S. population is exposed to unhealthy air) and better science to establish links between environmental pollutants and health effects (DROE). Yet, despite these warnings, the EPA's report definitely takes a favorable view of things.

How can we reconcile these conflicting perspectives concerning our environmental health? Well, there are a few important distinctions to keep in mind. Firstly, the EPA report is based on the U.S. alone whereas many of the most pressing environmental problems are happening elsewhere. Secondly, arguably, the environmental trends in the U.S. are improving in some important areas for two main reasons—the passage of national laws (i.e., The Clean Water Acts and The Clean Air Acts) over

the past thirty years and the move of "dirty" extractive and manufacturing industries to developing countries. The latter of these reasons likely results in a global environment that is worse off because most developing countries do not have environmental laws that require that industrial processes be clean and friendly to our planet. Thirdly, one of the major criticisms thus far regarding the EPA's report—that it greatly undervalues the importance and likelihood of future climate change—suggests a solid reason for the disparity. Since many of the projections for continued and future water shortages and habitat losses incorporate expected climate changes, a relaxation (or dismissal) of this important contribution would necessarily result in a more optimistic outlook. Lastly, the difference partly comes down to risk tolerance versus risk aversion. A risk tolerant attitude recognizes that risks of continued degradation to our environment are small and acceptable whereas a risk averse position holds that such risks are unnecessarily dangerous and avoidable. In the end, the current administration is risk tolerant when it comes to the environment (but not so tolerant when it comes to terrorists) and the majority view of environmental scientists is one of risk aversion. Educate yourself and take your pick.

As one can see, the Earth's health is a complicated topic that requires the inclusion of many variables and perspectives. It delves into considerations of human well-being as well as the welfare of other species and ecosystems too. And despite the fact that the research continues and new data keeps coming in, conclusions are clouded somewhat by one's worldview. That being said, our current conditions and trends on a global suggest poor and declining health, while the national picture has some bright spots worth noting and understanding.

With the above realizations in mind, it is time that we reflected on the part we play in the Earth's well-being. Whether obligated because of spiritual or moral values, we ought to improve the planet's habitability for nearly all life forms (save for smallpox and a few other virulent ones). Earth is the only planet that can support us, yet we continue to rapidly consume and contaminate its natural resources. Through modernization, industrial growth, and short-sightedness over the past two hundred years, we have recklessly damaged the one ecological treasure that we rely on—the Earth itself. Unless our global societies can begin the process of healing the Earth's ailments and forging a less destructive symbiotic relationship with the planet, we are destined to exterminate, not only most of the animals and plants on the planet, but, ourselves as well. Let's continue to monitor our vulnerable planet and take precautions to prevent further denudation and illness.

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