

## Everyone poops, but where does it go?

*Eco-researcher Mark Nelson proposes an alternative solution to flushing away the valuable resource of human waste*

### What is it?

*The Wastewater Gardener* takes a global look at how we are misusing one of the world's most valuable resources: human waste. Dr. Mark Nelson, who has worked for several decades in closed ecological system research, says that not only are we wasting a free, natural fertilizer, we're polluting our dwindling supply of fresh water. In the book, Nelson offers a brief history of how we got into this "shitty" mess—and proposes a way to get out of it.

Up until the beginning of the twentieth century, human feces were regarded as a resource—fertilizer, medicine, face cosmetic—not as waste to be disposed. Now, in our "modern, civilized" society, indoor plumbing has changed that. Dr. Nelson says, "While some praise indoor plumbing and the flush toilet as sterling achievements, for others, it is the height of insanity to use drinking water to dispose of human waste and then wash it away into large bodies of water, spreading the potential for pollution of all Earth's water bodies."

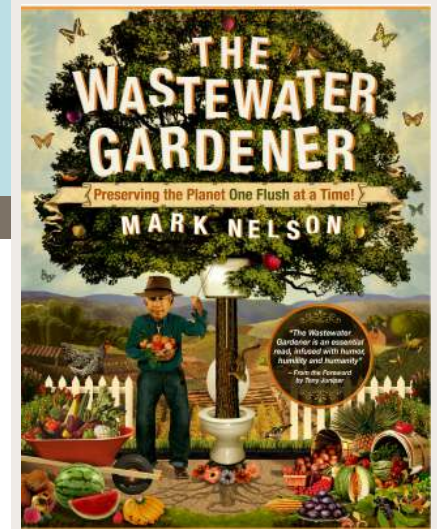
What is the solution to keeping waste out of our drinking water? Wastewater Gardens—constructed wetlands that act like a "kidney" to treat effluent and purify all water, using only plants, microbes, sunlight and gravity.

Dr. Nelson began a life-long love affair with constructed wetlands while managing the sewage system of Biosphere 2, the most notable biological experiment of the 20th century. Since then, Dr. Nelson has constructed wastewater gardens all over the world—from the Yucatan to the Bahamas, from the Philippines to France, from Morocco to New Mexico and Australia. He is currently working on projects in Bali and Iraq.

In the book, Dr. Nelson offers large-scale ideas for what he calls managing the "Fecesphere" as well as tips for individuals wanting to conserve water (composting toilets, low-water use appliances). He also asks readers to consider a simple idea each time they visit the loo: the travel itinerary of waste. Because, as he says, "We change the world one small step at a time, one flush at a time."

### Why is it important?

The proposed 2015 budget of the Environmental Protection Agency (EPA) is a \$300 million reduction from the 2014 budget of \$8.2 billion. The biggest cut? \$581 million from a fund that helps states build wastewater and drinking water projects. (Why isn't this a priority? Simple, Dr. Nelson says: sex sells, shit doesn't.)



### BOOK DETAILS

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## Who wrote it?

Mark Nelson, Ph.D., is an eco-system engineer and researcher, and one of the original “Biospherians.” He is Chairman and CEO, and a founding director, of the Institute of Ecotechnics ([www.ecotechnics.edu](http://www.ecotechnics.edu)), a U.K. non-profit organization consulting on several demonstration projects working in challenging biomes around the world. He is also Vice Chairman of Global Ecotechnics Corp. and consults on wastewater reuse and recycling using Wastewater Gardens®, subsurface-flow constructed wetlands.

Dr. Nelson was a member of the eight-person crew inside Biosphere 2, the 3.15 acre materially-closed facility near Tucson, Arizona, during the first two-year closure experiment (1991-1993). He has worked for several decades in closed ecological system research, ecological engineering, the restoration of damaged ecosystems, desert agriculture and orchards and wastewater recycling. He holds a Ph.D. in Environmental Engineering Sciences from the University of Florida; an M.S. from the School of Renewable Natural Resources, University of Arizona; and a B.A. in Philosophy/Pre-Med Sciences from Dartmouth College.

His Wastewater Gardens projects have taken him to the coast of Yucatan, Mexico; the high desert grassland south of Santa Fe, New Mexico; the semi-arid tropical savannah of West Australia; the resorts of Bali; and most recently, the deserts of Iraq. He is the author of *The Wastewater Gardener* and co-author of *Life Under Glass* and *Space Biospheres*.

## News tie-ins & core messages:

- The Wastewater Gardener: the nitty-gritty of Dr. Nelson’s work constructing wetlands from Bali to Mexico.
- The Taboo of Poo: A Brief History of How Waste Went From Fertilizer to Pollution
- Change the World, One Flush at a Time! What you can do
- Composting Toilets: An Eco-Friendly Alternative
- Travelin’ Man: On the Scent of Solutions Around the World—from West Australia to Iraq.
- Shit Politics: The EPA’s budget cut of \$581 million from a fund that helps states build wastewater and drinking water projects
- My Two Years as a Manager of a Small, Recycling World: Mark’s experience in Biosphere 2



## Why should people care?

The pollution of water is now virtually everywhere. The reason is simple: where do you send those millions of gallons of effluent—the liquid waste, increased in volume by the water needed to flush it away? The adage of sanitary engineers of old was “the solution to pollution is dilution,” but running water does not purify itself.

Human feces can cause a multitude of diseases, including major killers endemic in the developing world: diarrhea, cholera, and typhoid. Contamination and the spread of disease are found even in cultures renowned for their ecological sustainability.

The health of humans is intrinsically connected with the health of the Earth’s biosphere—and proper re-use of human waste is essential to the health of the planet.

## Shit-tistics:

- An adult human produces ½ to 1 pound of waste per day
- With more than 7 billion people on the planet, that comes to at least 3½ billion pounds or 1.75 millions tons per day; over 600 million tons per year!
- In the rice paddies of Bali and SE Asia, infant mortality rates remain high partly because drinking water is polluted by human shit.
- As much as half the chemical nitrogen applied to crops and 20% of the phosphorus, washes off into groundwater, rivers, lakes and ultimately into the oceans.
- A horse produces about 17,000 lbs. of manure (fertilizer) a year. That’s almost 50 lbs. a day!