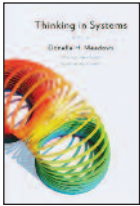




## THE TOOLS WE NEED

BY CECIL BOTHWELL



### Thinking in Systems

by Donella Meadows

**A**s a long-time admirer of Donella Meadows's work, and knowing that she died much too young in 2001, I was surprised and enormously gladened to learn that another book of her work had been published. Shortly before her death, Meadows had all but completed *Thinking in Systems: A Primer* (Chelsea Green Publishing, 2008), which has now been edited by Diana Wright and released by the Sustainability Institute.

Meadows is probably most widely familiar as the lead writer of the Club of Rome's prescient *The Limits to Growth* (Universe Books, 1972), together with updated versions of the book published in 1992 and 2004. The book continues to stir controversy almost 40 years after the authors' original research, because it offers up the most profound of inconvenient truths: Population overshoot is almost certainly going to wreak tremendous havoc on humanity, and its effects will almost certainly occur during the lifetime of people now living.

The latest edition of *Limits* suggests that there is some small reason for hope

grounded in our global response to ozone depletion. Recent international agreements show that we are able to move politically and cooperatively to address a common crisis. That hope is somewhat diminished by the fact that we don't yet know if our concerted response will prove sufficient, but we at least have earned an "A" for effort.

That problem—our response to global climate change and the ramifications of planet-threatening emissions—is illustrative of the core story Meadows offers in her latest book. Systems have inputs and outputs that we can learn to measure and interpret, but all systems are interactive and therefore enormously complicated at the biggest scale. We can gain a great deal through study of systems theory, especially the fact that we ignore the macro at our peril.

### Pushing the Lever

Whereas *Limits* addresses our global predicament with possible responses and outcomes based on computer modeling, *Thinking in Systems* is focused on methodology and will become recognized as Meadows's masterwork. The book has been accurately likened to *Silent Spring* for its breadth and clear explication of profound truths about the world. Meadows explains systems in easy-to-understand steps that shed the math and jargon of more technical texts but without dumbing down the material. The reader exits the book with a much deeper understanding of how systems operate, from the simplest to the most complex. Ever the wise teacher, Meadows shows how to look at malfunctioning systems, whether in your home, business, town, or planet, and find the pressure points where it is possible to make a difference. She explains how and why we smart human beings so often recognize exactly the place where we should push a lever—and almost

always push it the wrong way.

Meadows's knack, illustrated over her entire career in her teaching, farming, research, lectures, newspaper columns, and books, is to explain complicated ideas with everyday examples. One thread in the current title involves a car dealer who attempts to keep a steady supply of vehicles on her lot. At the simplest level, the system consists of noticing sales and ordering replacements: Cars on the lot comprise the stock, deliveries from the manufacturer are the input, and sales are the output.

Keeping stock steady might appear to be a simple goal, but as we move through the lessons, the author tosses in complications that move the model closer and closer to the real world. Sales are not predictable, and guessing at future output depends on evaluation of past performance, the general economy, and much else. Delivery time may vary, perhaps in reaction to output: If sales of a particular model are up nationally, the factory might be struggling to fill orders. Step up again, and we notice that the assembly plant depends on parts from manufacturers with their own demand and delivery issues. The supply of parts may be mediated by resource depletion and energy input, while auto sales may fluctuate because of gas prices determined in part by wars in the Mideast and hurricanes in the Gulf of Mexico.

Meadows's genius lay in turning such complexities into meaningful vernacular, and the book is deep without being impenetrable. It's full of wonderful "Aha!" moments. Meadows is gone, but she left us with the tools to fix our lives and our world. It's time to get to work. ■

**Cecil Bothwell** is a journalist. His most recent book is *Pure Bunkum: Reporting on the life and crimes of Buncombe County Sheriff Bobby Lee Medford* (Brave Ulysses Books, 2008).

### TEAM TIP

Donella Meadows's engaging "Global Citizen" articles are as relevant today as when she first wrote them. Use them to explore different applications of systems thinking in global systems and in daily life:

[http://www.sustainer.org/dhm\\_archive/](http://www.sustainer.org/dhm_archive/)