

What is this?

"Increasingly, complex socio-technical public policy issues involve scientific uncertainty and even complete ignorance of phenomena. The lack of crisp description of uncertainties often leads to lack of trust by the general public, which in turn impedes solving serious public policy issues. One-sided ideas of 'sound science' that do not carefully describe uncertainties and degrees of unknowns also confuse public discussion. They all increase the need for ways to understand and display what we do not know as well as what we do know.

Future studies are by definition about the unknown. We try to understand key features about possible futures with a variety of techniques from simulation to scenarios, forecasts to conjectures. Many of these methods attempt to say what might happen, but not how we will get to know what is unknown. Rarely are we content to simply say what we do not know. Rarely do we specify the paths to knowing more about unknowns. However, the approach to stating what we do not know is beginning to be explored through the creation of visual information murals.

The info-mural on Unknowns about GM Crops
These issues came to my attention most directly as I was working on a pilot project on genetically modified crops (GMC). A number of the key discussions about GMC were focused on the precautionary principle that is explicit about what should be done in public policy when there is 'lack of scientific certainty'. It is stated in one version: 'Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.' United Nations Economic Conference for Europe, 1990 'If there is lack of scientific certainty, this means that there are identifiable areas of lack of knowledge—there are things that science does not know. I asked myself: If scientific unknowns figure strongly in the application of the precautionary principles, exactly what is it that we do not know in a particular domain? And then, from the design and communication standpoint, I wondered: 'How would we represent these unknowns in a attractive, useful, inviting, and organized way?' This has led to the development of a new class of diagrams or knowledge maps called 'Unknowns Maps'.

Metaphor of darkness
I have used the idea of an 'information mural', a now widely used method of communicating complex scientific technical and organizational information. The mural uses the metaphor of darkness to convey the idea of our ignorance and the figures of scientists with flashlights (torches) shining on small fragments of text that describe what we do not know. The streetlights at the bottom illuminate what science does know.

Uses of the mural
Some have suggested that the murals should be placed in the lobby to biology and ecology buildings around the world. One biologist told me themural could be used to inspire students to choose more daring dissertation topics than are frequently chosen. This first mural GM Crops has inspired the creation of other murals as well including one for what is unknown in ocean biology and one that characterizes the challenges to the growing field of visual analytics of which the unknowns map is only one example." (1)

1. Horn, R.E., (2005) What we do not know: Using information murals to portray scientific ignorance, *Futures*

How do I get a printed copy?

You can print this map out at your local print service bureau in various sizes.

How do I get updates & revisions and other info-maps in the series?

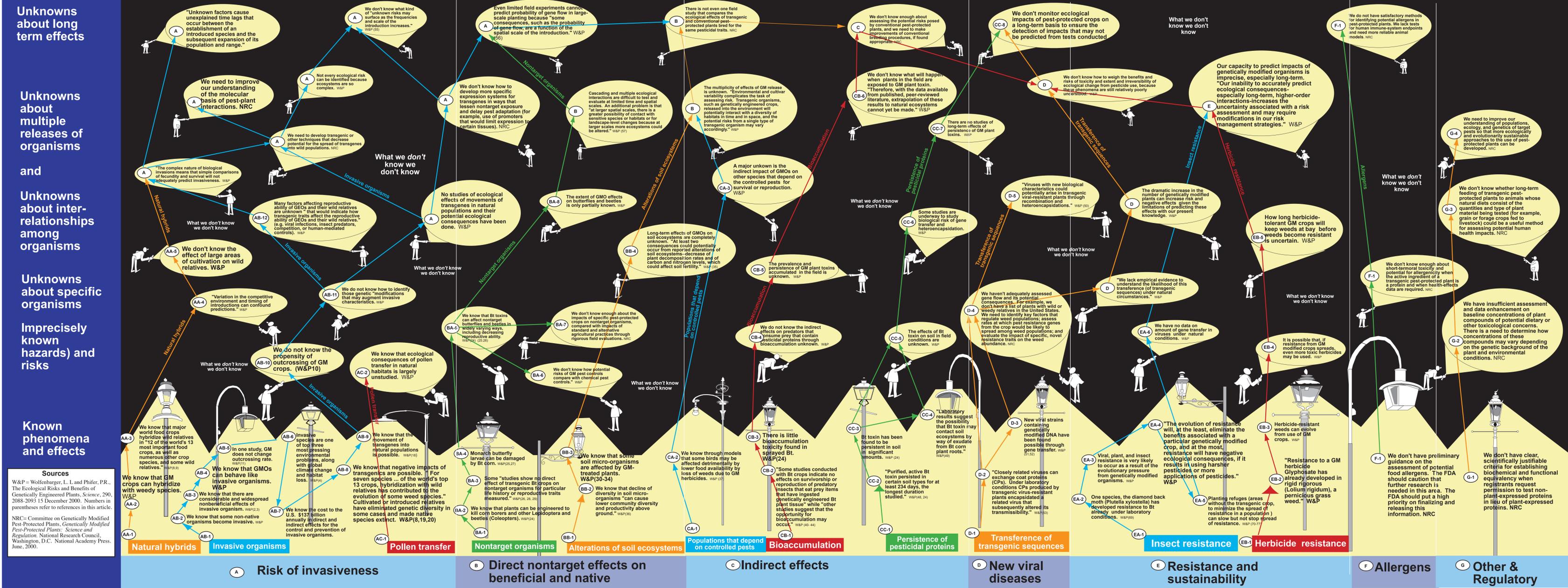
Robert E. Horn, Stanford University
President, MacroVU@, Inc
hornbob@earthlink.net

Draft v.6
Please send comments and suggestions to
hornbob@earthlink.net

What we know—and what we don't know—about the ecology of genetically modified plants

Abbreviations
GEO = genetically engineered organism
GMO = genetically modified organism
W&P = Wolfenbarger, L. L. and Phifer, P.R., authors of the Science article
NRC = National Research Council (some of the reports on which this map is based).

2001



Unknowns about long term effects

Unknowns about multiple releases of organisms and

Unknowns about inter-relationships among organisms

Unknowns about specific organisms

Imprecisely known hazards) and risks

Known phenomena and effects

© 2001, R.E. Horn. All rights reserved.
R. E. Horn
Visiting Scholar
Stanford University
2819 Jackson St. #101
San Francisco, CA 94115
(415) 775-7377
hornbob@earthlink.net
URL: www.stanford.edu/~horn