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# Biological Risks

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**Cairo 3 April 2007**

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(NTI)**

**and**

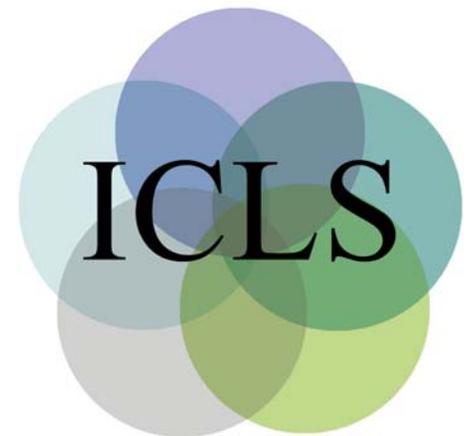
**International Council for the Life Sciences**

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# Understanding Biological Risk

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- ◆ Extraordinary advances in life sciences and biotechnology bring enormous benefits to medicine, public health, and agriculture
- ◆ But the risk to public safety and security from the misuse of this science and technology needs to be minimized by the engagement of the life sciences community

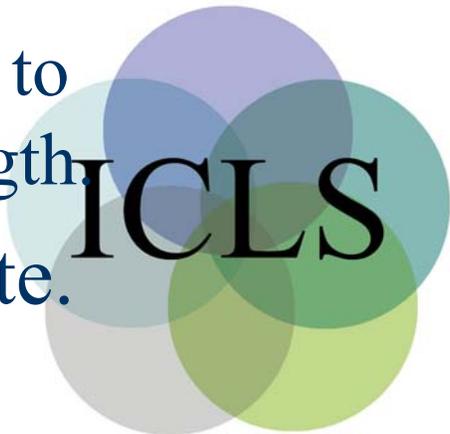


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# Pace of the Advances

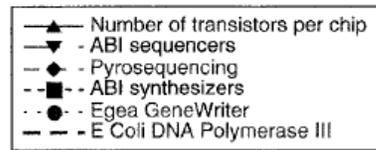
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- ◆ Moore's Law – computing power doubles every 18 months
- ◆ Carlson's Law
  - Starting in 2002 it took two years for a team to synthesize the polio virus
  - In 2005 it took two weeks for a team to synthesize a virus of comparable length.
- ◆ Cost reducing at about the same rate.

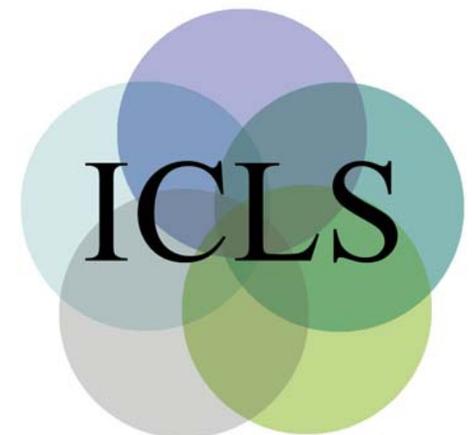
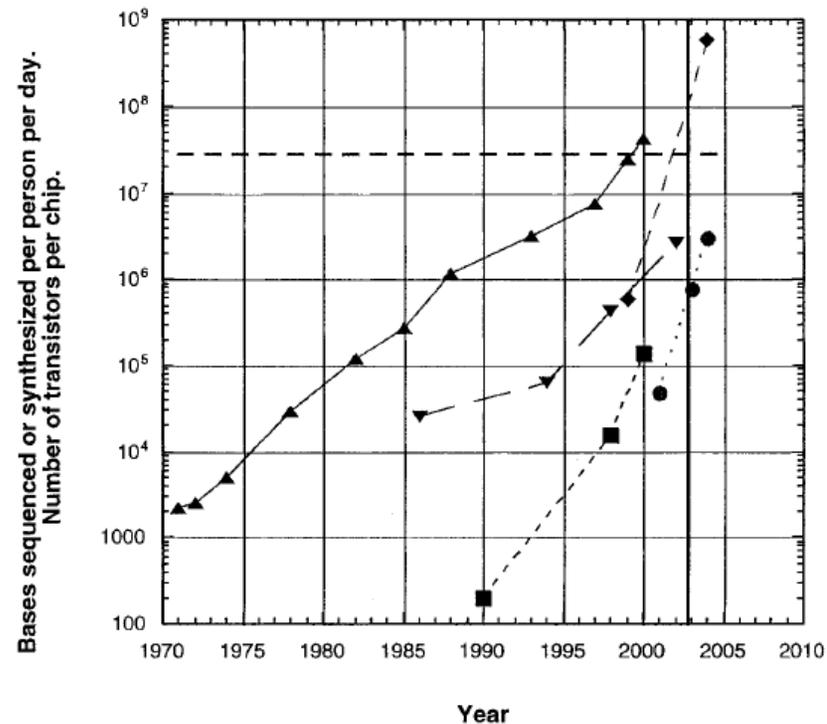
The logo for ICLS (International Center for Life Sciences) features the letters 'ICLS' in a bold, black, serif font. The text is overlaid on a cluster of five overlapping circles in shades of purple, blue, green, and yellow. The circles are arranged in a roughly circular pattern, with the 'I' and 'C' overlapping the top-left circle, the 'L' overlapping the top-right circle, and the 'S' overlapping the bottom-right circle.

ICLS

# Carlson's "Law"



**Productivity Improvements in DNA Synthesis and Sequencing**  
(as of October, 2002)



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# Special Challenges

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- ◆ Lack of shared global language, risk assessment methodologies and standards in biosafety and biosecurity
- ◆ Challenge to traditional multilateral institutions, individual scientific organizations and national governments

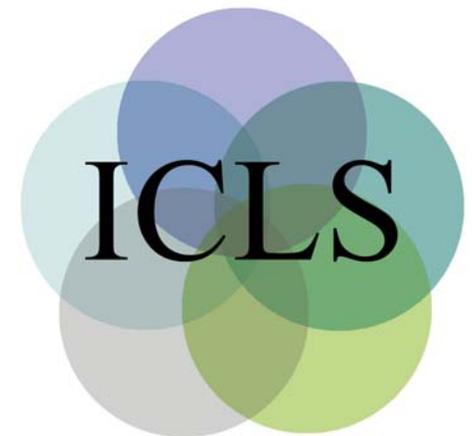


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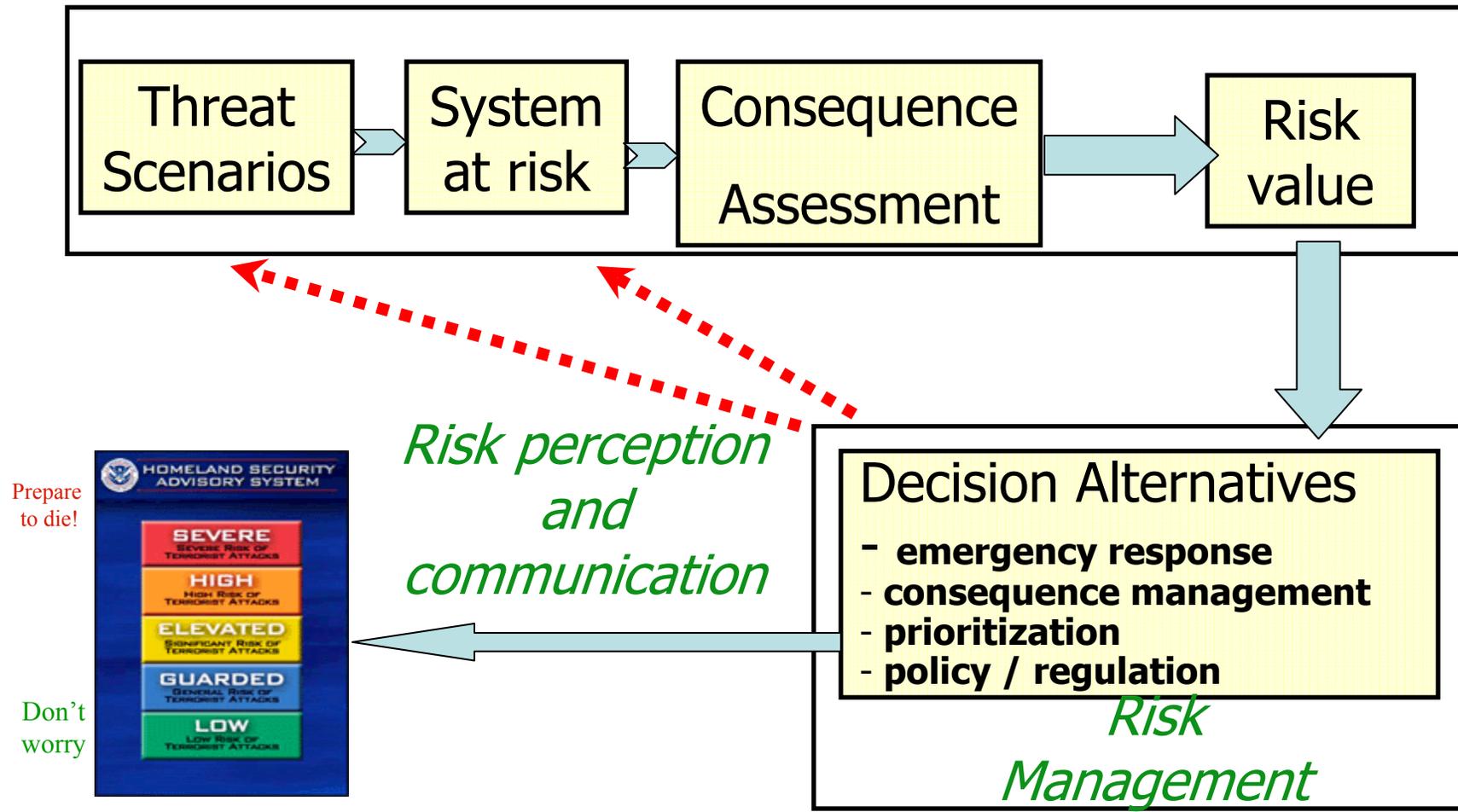
# Spectrum of Biological Risk

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- ♦ Naturally occurring disease
- ♦ Re-emerging disease
- ♦ Anti-biotic resistant disease
- ♦ Accident or misadventure
- ♦ Deliberate use – state or non-state



# Risk Analysis



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# Risk Analysis

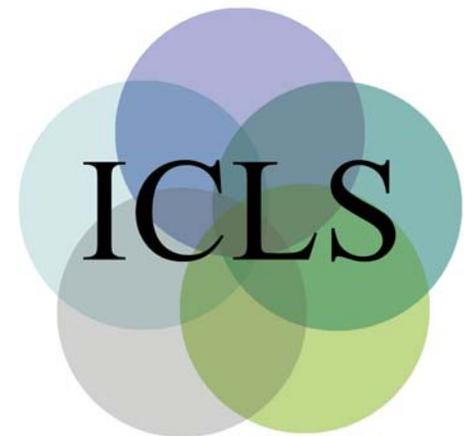
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Risk analysis should answer three questions:

What can go wrong ?

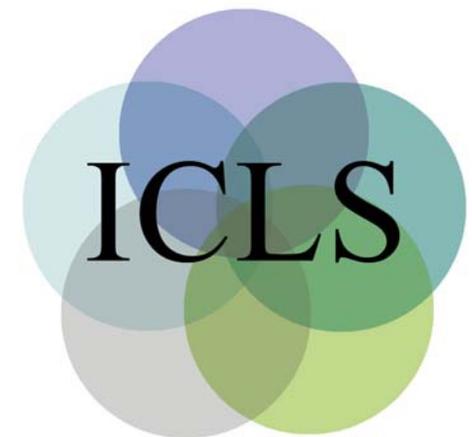
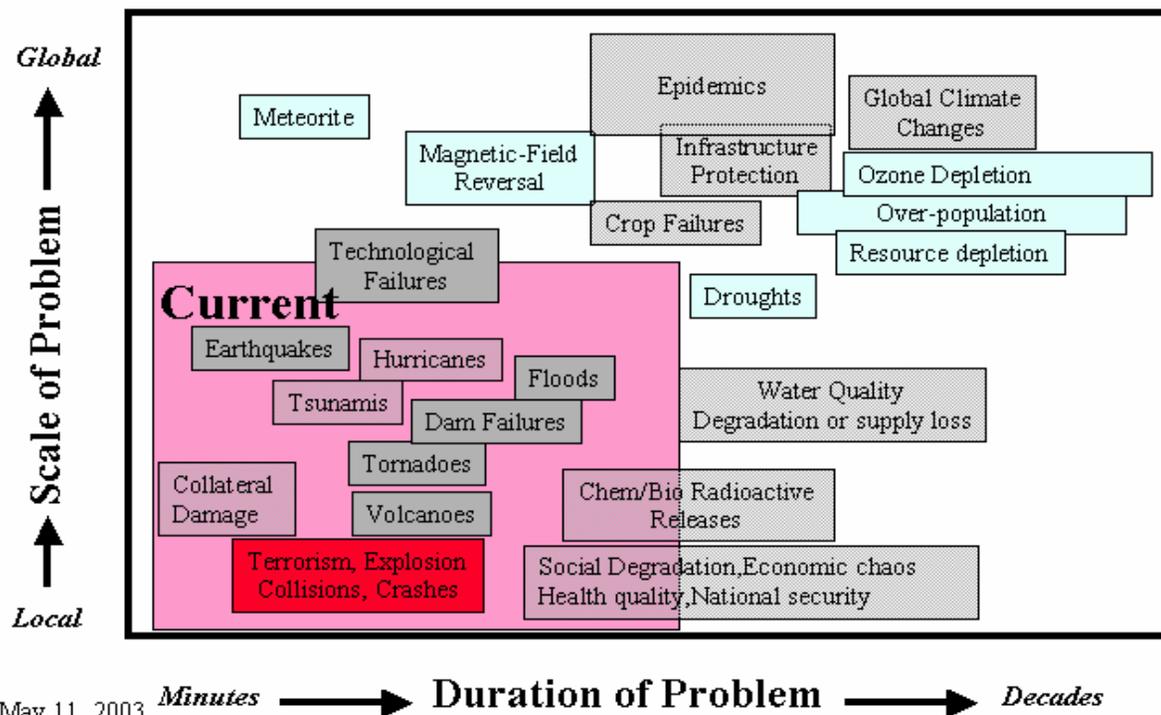
How likely is it to happen?

What are the consequences?



# Focus of Most Current Methodologies

Most Analyses Concentrate on Evaluation of Relatively Short Duration and Limited Scale Phenomena



Eric May 11, 2003

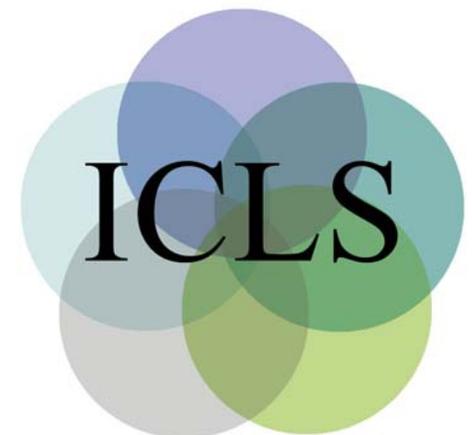
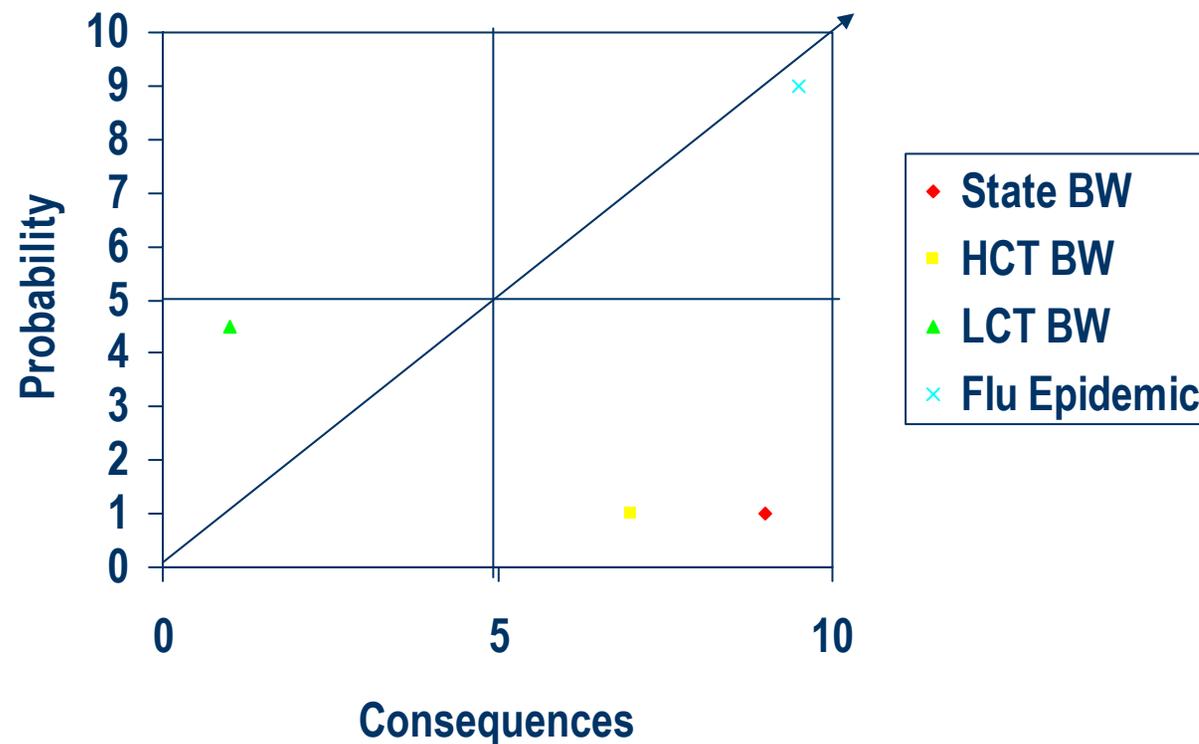
19 February 2007

Terence Taylor ICLS

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# Infectious Disease Risk Matrix (illustrative)

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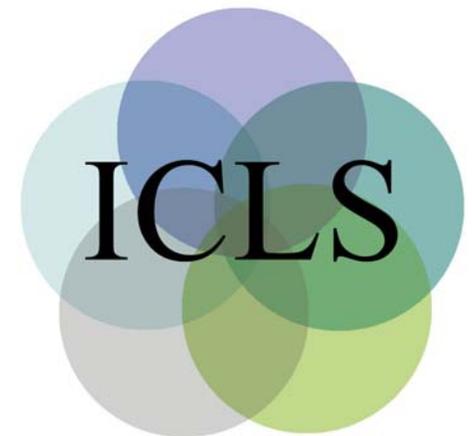


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# New Methodologies

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- ◆ US National Academy of Science
  - Globalization, Biosecurity and the Future of the Life Sciences (March 2006)
- ◆ Royal Society study November 2006
- ◆ International Advisory Panel on Biological Risk?



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Global Health and Security Initiative  
and  
International Council for the Life Sciences

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