SUSTAINABILITY OR COLLAPSE?

AN INTEGRATED HISTORY AND FUTURE OF PEOPLE ON EARTH

EDITED BY ROBERT COSTANZA, LISA J. GRAUMLICH, AND WILL STEFFEN
Table 1 and image from Folke et al. 2002: Can be used as an example for Specific Question #1 regarding resilience
Amoeba diagram of complexity with which Integrated Global Models (IGMs) capture socioeconomic systems, natural systems, and feedbacks

(from Costanza, R., R. Leemans, R. Boumans, and E. Gaddis. 2007)
The Challenge: Sustainable Management of an Ever-Changing Planet
Costanza et al. 2007
GREENHOUSE EFFECT from human activities has warded off a glaciation that otherwise would have begun about 5,000 years ago. Early human agricultural activities produced enough greenhouse gases to offset most of the natural cooling trend during pre-industrial times (yellow), warming the planet by an average of almost 0.8 degrees Celsius. That early warming effect (a) rivals the 0.6 degrees Celsius (b) warming measured in the past century of rapid industrialization (orange). Once most fossil fuels are depleted and the temperature rise caused by greenhouse gasses peaks, the earth will cool toward the next glaciation - now thousands of years overdue. Ruddiman (2005).
From Carpenter et al. 2001; resilience and scales
Table 2 and Figure 2 from Lüdeke et al. 2004: Question 7: past socio-ecological to modern across scales
QuickTime™ and a decompressor are needed to see this picture.

From: Messerli et al. 2000: Question 7
## Data to Knowledge

<table>
<thead>
<tr>
<th>Data</th>
<th>Information</th>
<th>Knowledge</th>
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<td><strong>Basic Elements</strong></td>
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<tr>
<td><strong>Methodology</strong></td>
<td>Exploratory-analysis</td>
<td>Model-based-mining</td>
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</table>

**Syntax**

**Semantics**

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Rob Raskin, NASA JPL, OPeNDAP Developers Meeting, February 2007

Figures courtesy of S. Aulenbach
Discussion

Figures courtesy of S. Aulenbach
A simple interface for all IHOPE members

Figures courtesy of S. Aulenbach
Participate, Catalog

Figures courtesy of S. Aulenbach
Give and Receive Relevant, Qualified Information

Figures courtesy of S. Aulenbach
Many ways to view the data
Figures courtesy of S. Aulenbach, VanderLeeuw 2005
From Steffen et al. 2007; Table 1 & Figure 2: Global indicators: Timelines
QuickTime™ and a decompressor are needed to see this picture.

From Kucera et al. 2005; Figure 1: Paleo Ocean reconstruction;p16