Globally Collaborative Environmental Peace Gaming

Globally Collaborative Environmental Peace Gaming (GCEPG) with a globally distributed computer simulation system, focusing on the issue of environment and sustainable development in developing countries, is to train would-be decision makers in crisis management, conflict resolution, and negotiation techniques basing on "facts and figures."

With global GRID computer networking technology and Beowulf mini-super computers of cluster computing technology, we plan to develop a socio-economic-environmental simulation system and a climate simulation system in parallel fashion, both of which are to be interconnected in global scale.

SIMULATION IN THE SERVICE OF SOCIETY (S^3)

John McLeod • Technical Editor Suzette McLeod • Managing Editor

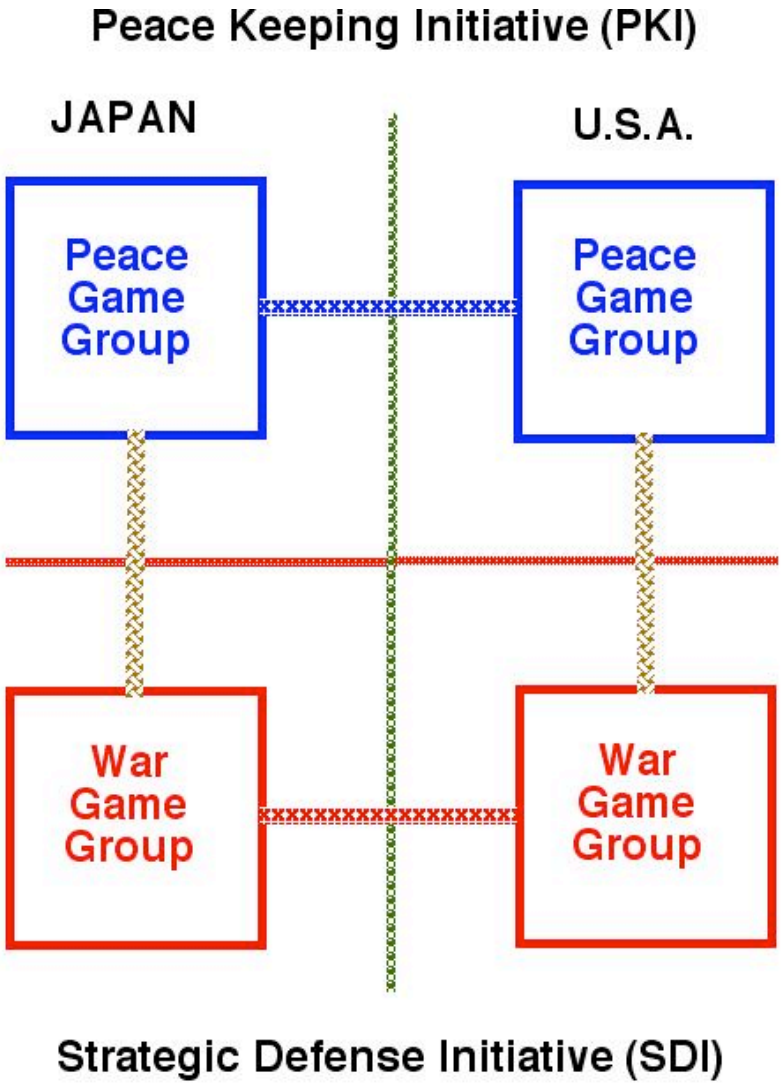
Big Game!

The push for understanding is going "out of this world" — literally. It is going to satellites and back. With feedback. That's the big game, a Global Game, today. So let's see where it's coming from.

Many moons ago, more than 200 in fact, there was great interest in world models. Those were the days of Jay Forrester, Dennis and Donella Meadows, Yoichi Kaya, Aurelio Peccei and the Club of Rome. Even your Ed. had visions of developing a world model when he started the World Simulation Organization — too soon. That effort fell on its face because the required infrastructure was inadequate and the push was too feeble.

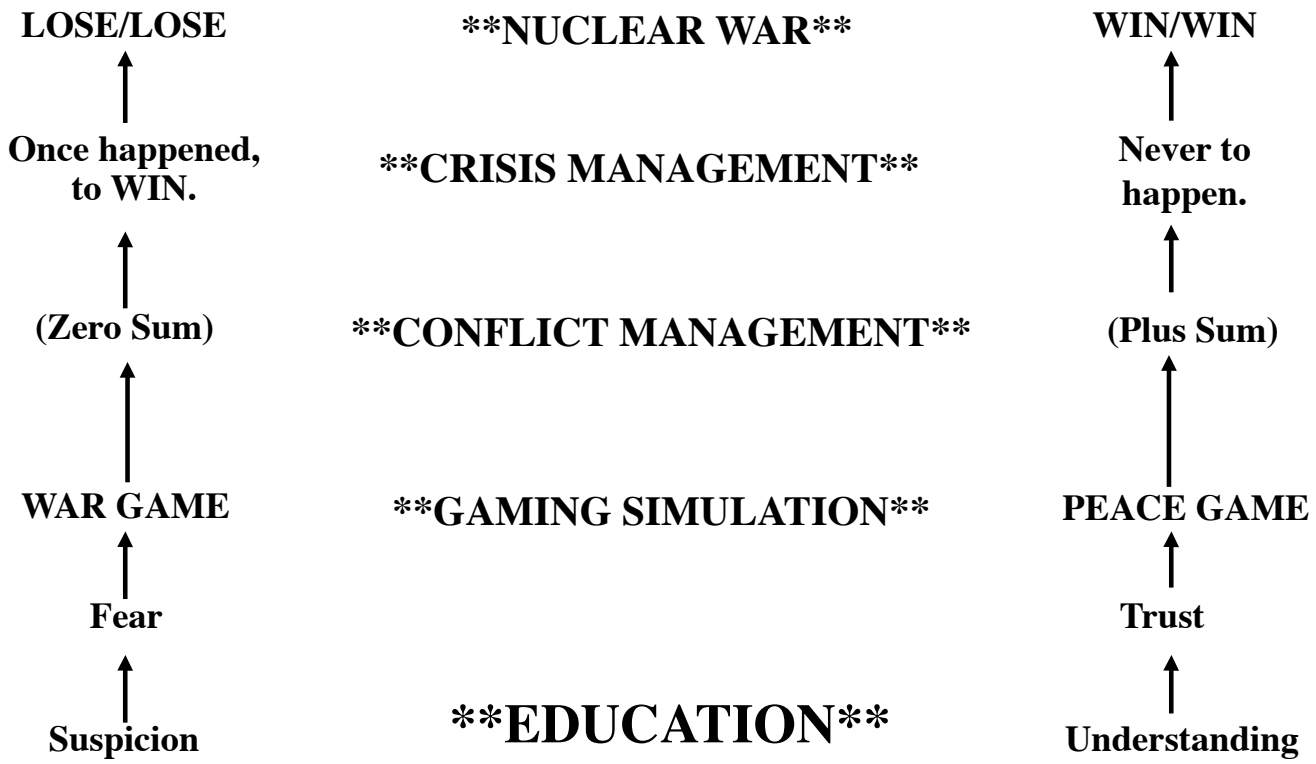
Today the technology required to support the infrastructure is here, or nearly so, and one man who has been pushing hard for 18 years is making demonstrable progress. That man is Dr. Takeshi Utsumi, who has given his time, talent, and considerable personal money to the effort.

Peace and War Gaming



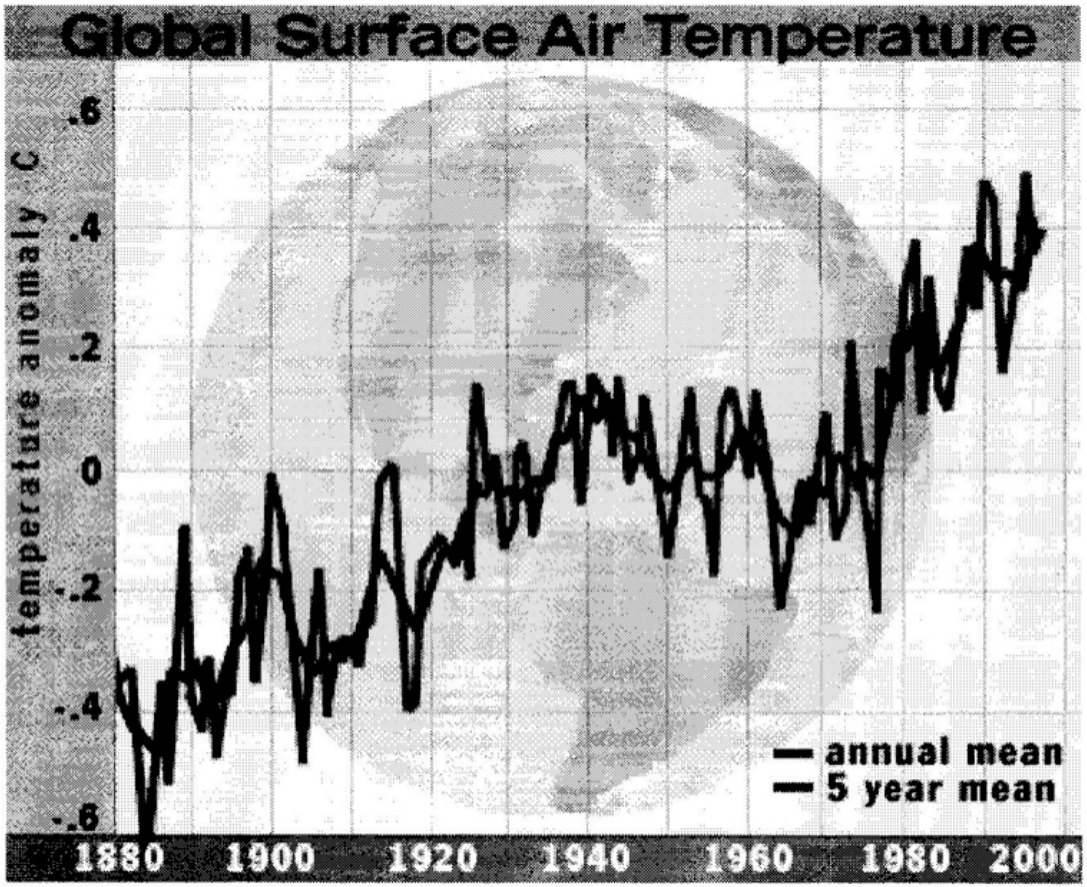
War and Peace Games

Peace Game is for Global Understanding



Cold War to Environmental Calamity

Rise of Global Surface Air Temperature



The global surface temperature differences since 1880 as compiled by NASA's Goddard Institute for Space Studies.
(Source: Goddard Institute for Space Studies)

http://www.abcnews.com/sections/scitech/warming1212/index.html
December 12, 1997

Global Changes

- **In a few generations humankind is in the process of exhausting fossil fuel reserves that were generated over several hundred million years.**
- **Nearly 50% of the land surface has been transformed by direct human action, with significant consequences for biodiversity, nutrient cycling, soil structure and biology, and climate.**
- **More nitrogen is now fixed synthetically and applied as fertilizers in agriculture than is fixed naturally in all terrestrial ecosystems.**
- **More than half of all accessible freshwater is used directly or indirectly by humankind.**
- **The concentrations of several climatically important "greenhouse" gases, in addition to CO2 and CH4, have substantially increased in the atmosphere**
- **Coastal wetlands have also been impacted by human activities, with the loss of 50% of the world's mangrove ecosystems.**
- **Extinction rates are increasing sharply in marine and terrestrial ecosystems around the world; we are now in the midst of the sixth great extinction event in Earth's history, but the first one caused by the activities of a biological species.**

National Academies/International Geosphere-Biosphere Programme (IGBP)
http://www.igbp.kva.se/cgi-bin/php/frameset.php

Hans Blix, the chief inspector of United Nations Monitoring, Verification and Inspection Commission (UNMOVIC):

"…on many [other] issues the United States must be multilateral: … To me the question of the environment is more ominous than that of peace and war. We will have regional conflicts and use of force, but world conflicts I do not believe will happen any longer. But the environment, that is a creeping danger. I'm more worried about global warming than I am of any major military conflict."

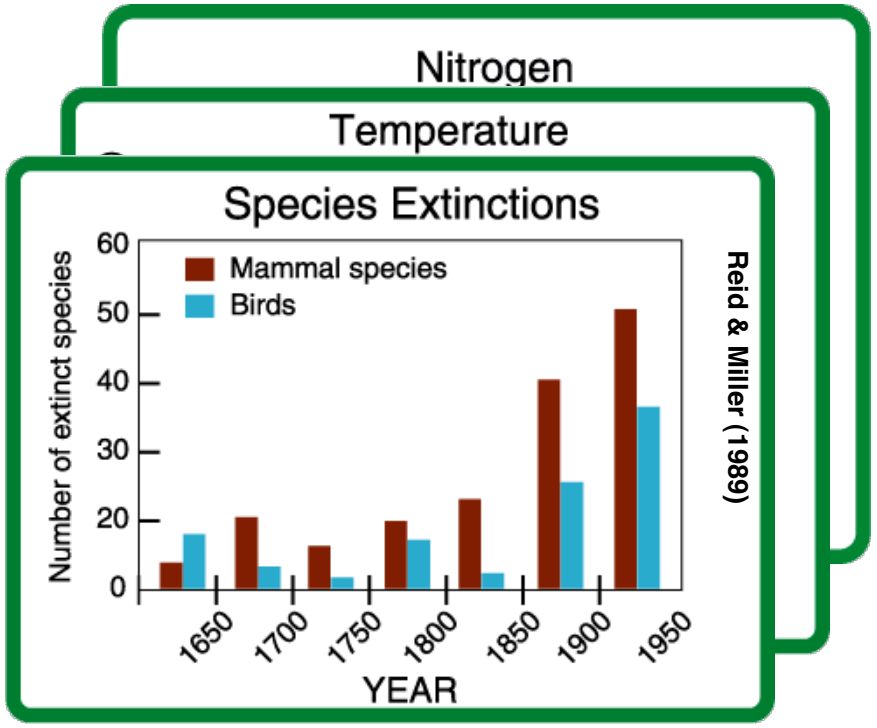
The New York Times, "QUOTE OF THE WEEK: Hans Blix's Greatest Fear," March 16, 2003

What is Global Change?

1. Global-scale changes that affect the functioning of the Earth System
2. Much more than climate change
3. Natural as well as anthropogenic changes
4. Socio-economic as well as biophysical

For example, changes in:

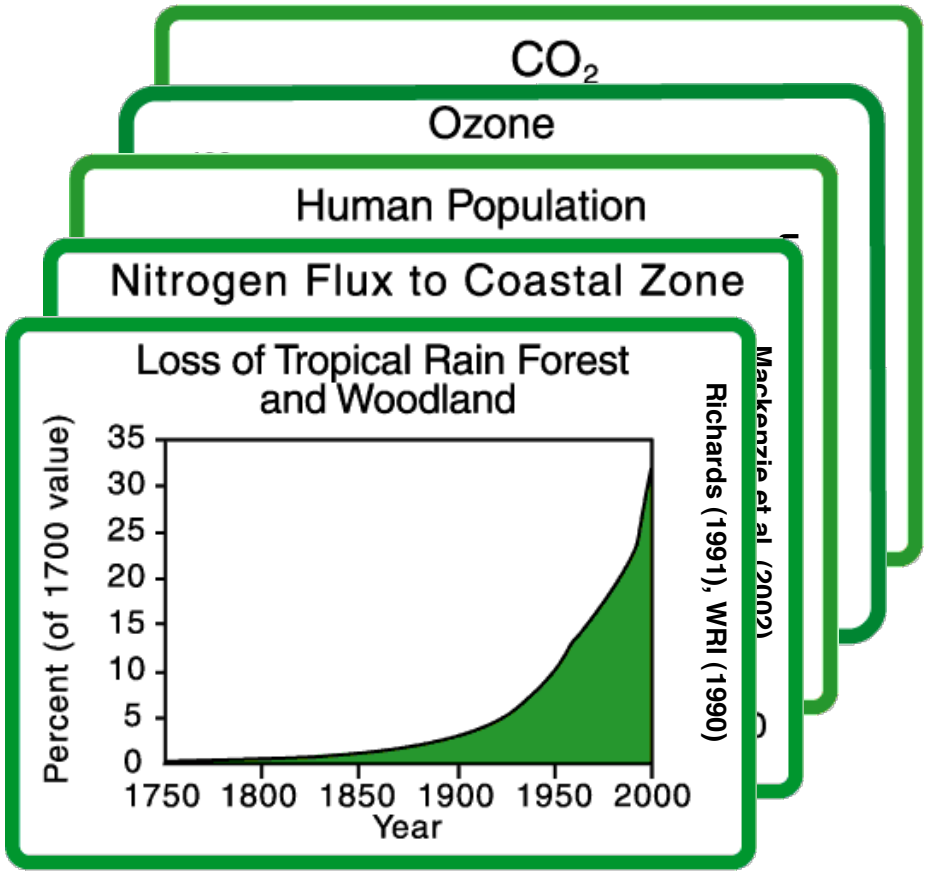
- Nitrogen fixation
- Temperature
- Biodiversity……..



What is Global Change?

For example, changes in:

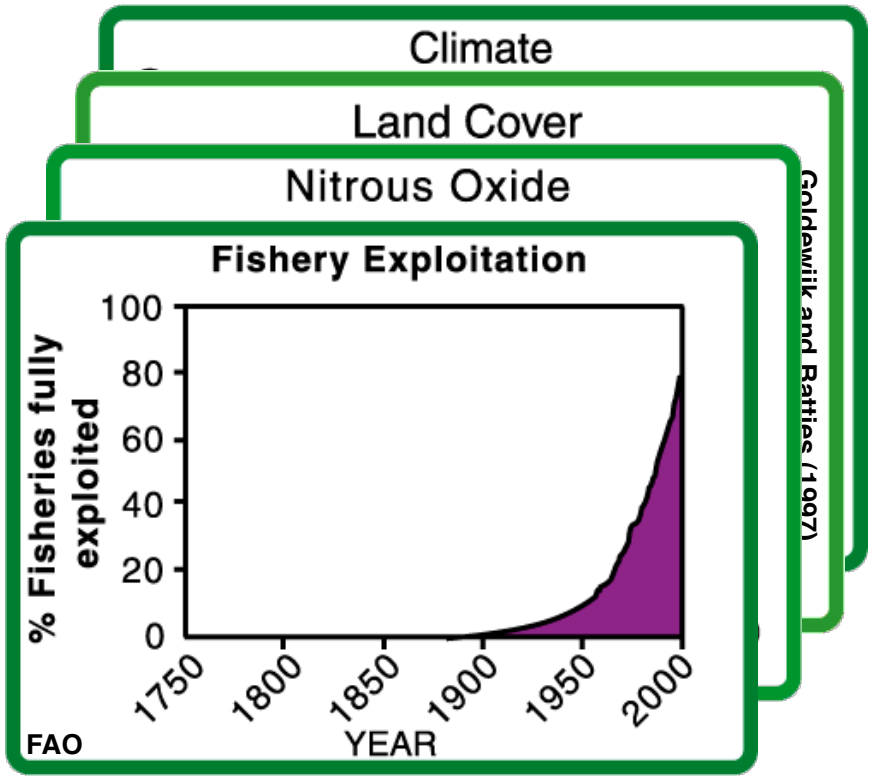
- Nitrogen fixation
- Temperature
- Biodiversity
- Atmospheric composition
- Population
- Nitrogen in the coastal zone
- Forest cover



What is Global Change?

For example, changes in:

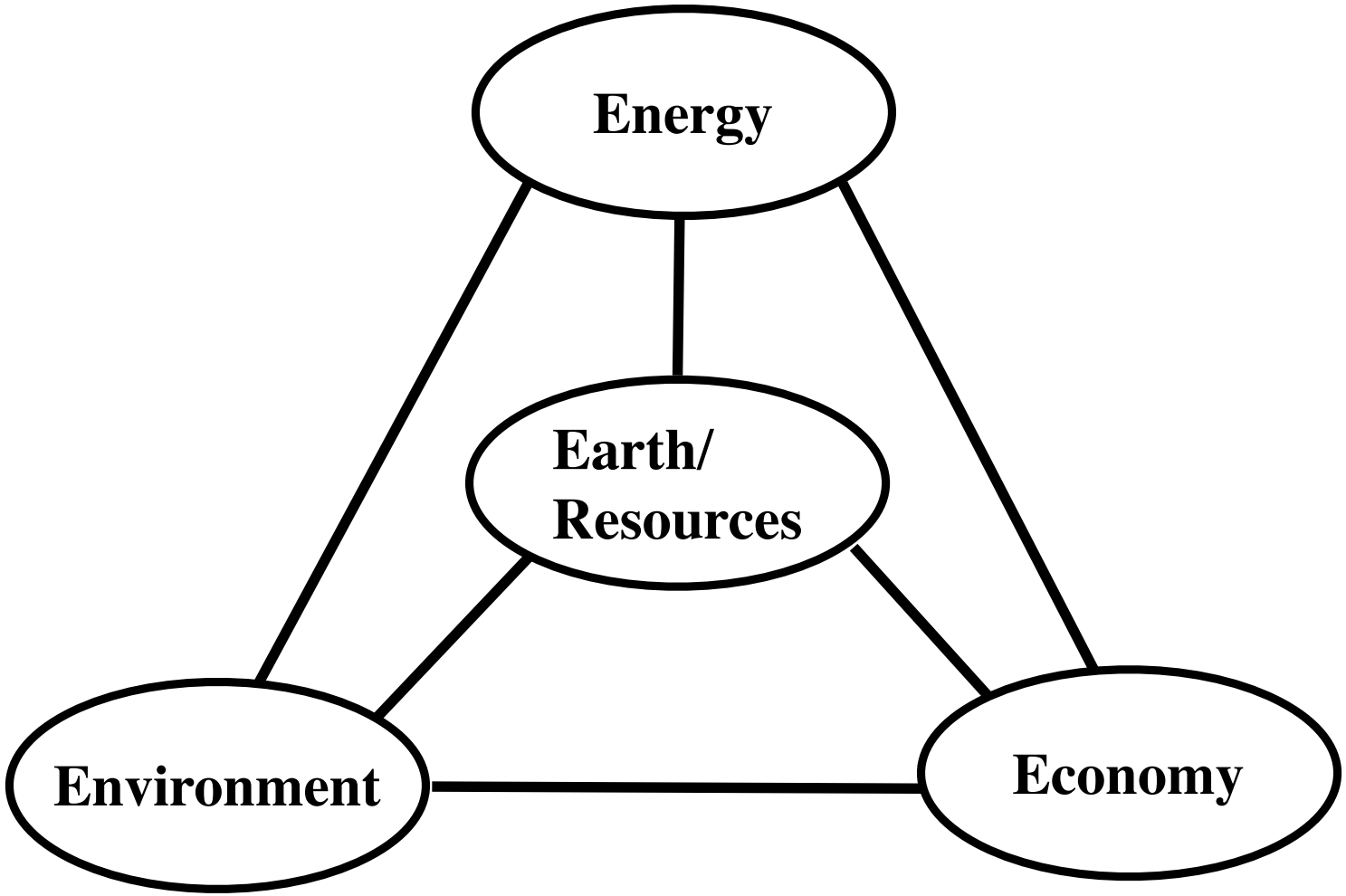
- Nitrogen fixation
- Temperature
- Biodiversity
- Atmospheric composition
- Population
- Nitrogen in the coastal zone
- Forest cover
- Climate
- Land use
- Nitrous oxide
- Exploitation of fisheries



Global Complexities

- Economy and Trade,
- Industrial Structures,
- Natural Resources,
- Environment and Pollution,
- Population,
- Etc.

4 E Components of
Globally Collaborative Environmental Peace Gaming



Three Necessary Components for Peace Gaming

1. **Telecommunication Infrastructure**
   - **Packet-Switching Telecommunication**
     - **Internet**
2. **Communication Means**
   - **E-mail**
     - **Multimedia**
3. **Game Players**
   - **Global University System**

Paul Baran

Inventor of
Packet-switching Data Telecom Technology

Deregulation of Japanese Telecom Policy for the Use of Email

UNITED STATES DEPARTMENT OF COMMERCE
International Trade Administration
Washington, D.C 20230

APR 6 1982

Dr. Takeshi Utsumi
Global Information Services
43-23 Colden Street
Flushing, N.Y. 11355

Dear Dr. Utsumi:

Enclosed are three cables from the U.S. Embassy in Tokyo reporting on the recent move by the Ministry of Posts and Telecommunications (MPT) to remove the usage restrictions on the ICAS system.

According to the Embassy, MPT's action will allow Global Information Services to offer electronic mail, computer conferencing, and word processing services to Japanese customers via the ICAS system. It thus appears that Global's TFC case has been favorably resolved.

Please review the enclosed cables and let me know your reaction. If you have no objection, we will close this case.

Sincerely,

Philip R. Agress
TFC Staff Officer

Enclosures (3)

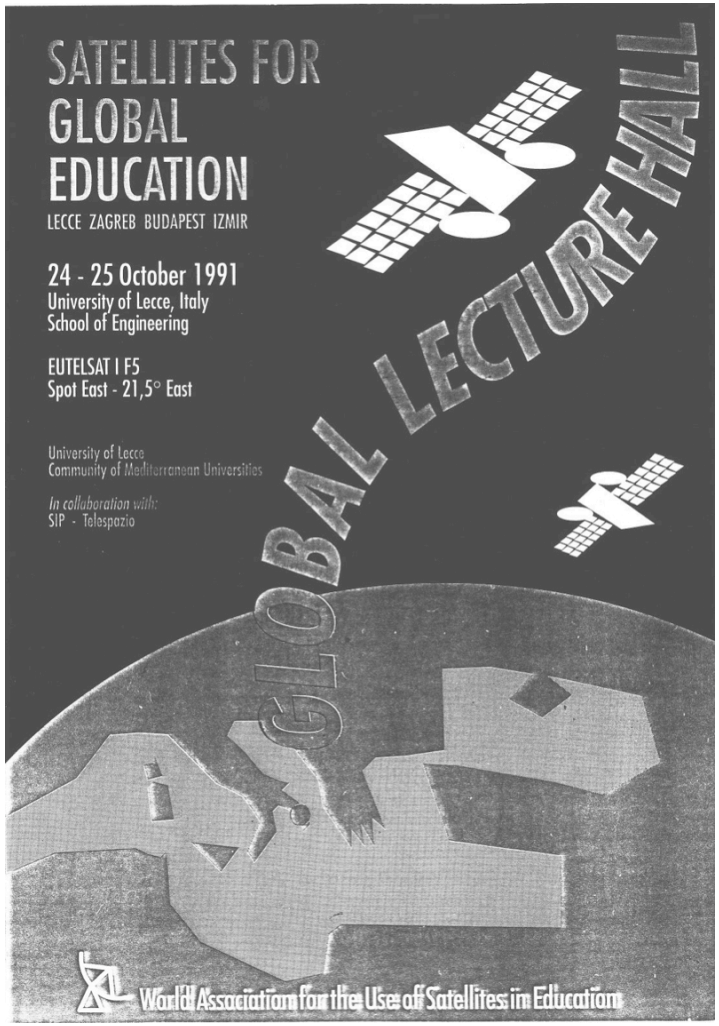
Users of E-mail

(750 million as of 2003)

Business Week, June 27, 1994, page 6

Global Lecture Hall (GLH)

Lecce, Zagreb, Budapest, Izmir
University of Lecce, October 24-25, 1991



Necessary Systems to Construct

- Globally distributed computer simulation system,
- Globally distributed decision-support system,
- Global neural (GRID) computer network system

Advantages of Distributed Simulation

1. Increase of Credibility
2. Data Security
3. Flexibility
    a. Use of any language within local simulation
    b. Same for methodology, machine, etc.
4. Participatory Democracy with Bottom-up Decision
5. Cooperation for Better Understanding
6. Suitable for Large-scale, Confrontation-prone, Global problems

Modeling, Simulation and Gaming

- **MODELING:** **should refer to the gathering and structuring of data in such a way that the values of the parameters, the initial values of the variables, and their interrelationships are formalized.**

- **SIMULATION:** **(Real-World oriented, Mathematical Model) should be reserved to the use of a model to carry out "experiments" specifically designed to study selected aspects of the simulant, i.e., the real-world or a hypothesized system that has been modelled.**

- **GAMING:** **(Decision making oriented) refers to man-machine-simulation in which human judgement is exercised to influence the dynamics of the model during the course of a study.**

Reference: McLeod,J.; "Simulation Today - and Yesterday ";Simulation Today, No. 1, p.3 (Appearing in SIMULATION, Vol 18, No. 5, May (1972))

Three Modes of Simulation

1. **MAN-SIMULATION:** Human beings model a simulant of the real world or of a hypothesized system and the descision-makings are entirely made by them with computer conferencing systems.

2. **MACHINE-SIMULATION:** The structure and activity as well as the decision making functions are entirely embedded in computer software.

3. **MAN-MACHINE-SIMULATION:** Computer software is used to model part of simulant, the decision-making apparatus is divided in some manner between a human being and a computer.

GAMING (interactive) SIMULATION
implies to MAN-MACHINE-SIMULATION

Methodologies of Socio-Economic Simulation

1. **Dynamic Methodologies:**
    - **a. Econometrics**
    - **b. System Dynamics**

2. **Static Methodologies:**
    - **a. Input/Output Method**
    - **b. Linear Programming**

3. **Communication-oriented Methodologies:**
    - **a. Policy Delphi**
    - **b. Cross-Impact Matrix Analysis**
      (Probabilistic System Dynamics)

System Dynamic Simulation with Cause-and-Effect Analysis and Feedback Loop

- Non-linear, holistic thinking of the whole system instead of linear, narrow, single issue thinking.
- Counter-intuitive, instead of intuitive.
- Learning the system mechanism and its behavior.
- Rational decision making habit based on FACTS and FIGURES.
- GOOD FOR POLICY ANALYSIS OF SOCIO-ECONOMIC SYSTEMS.

Cause-and-Effect Diagram of World Dynamics Model

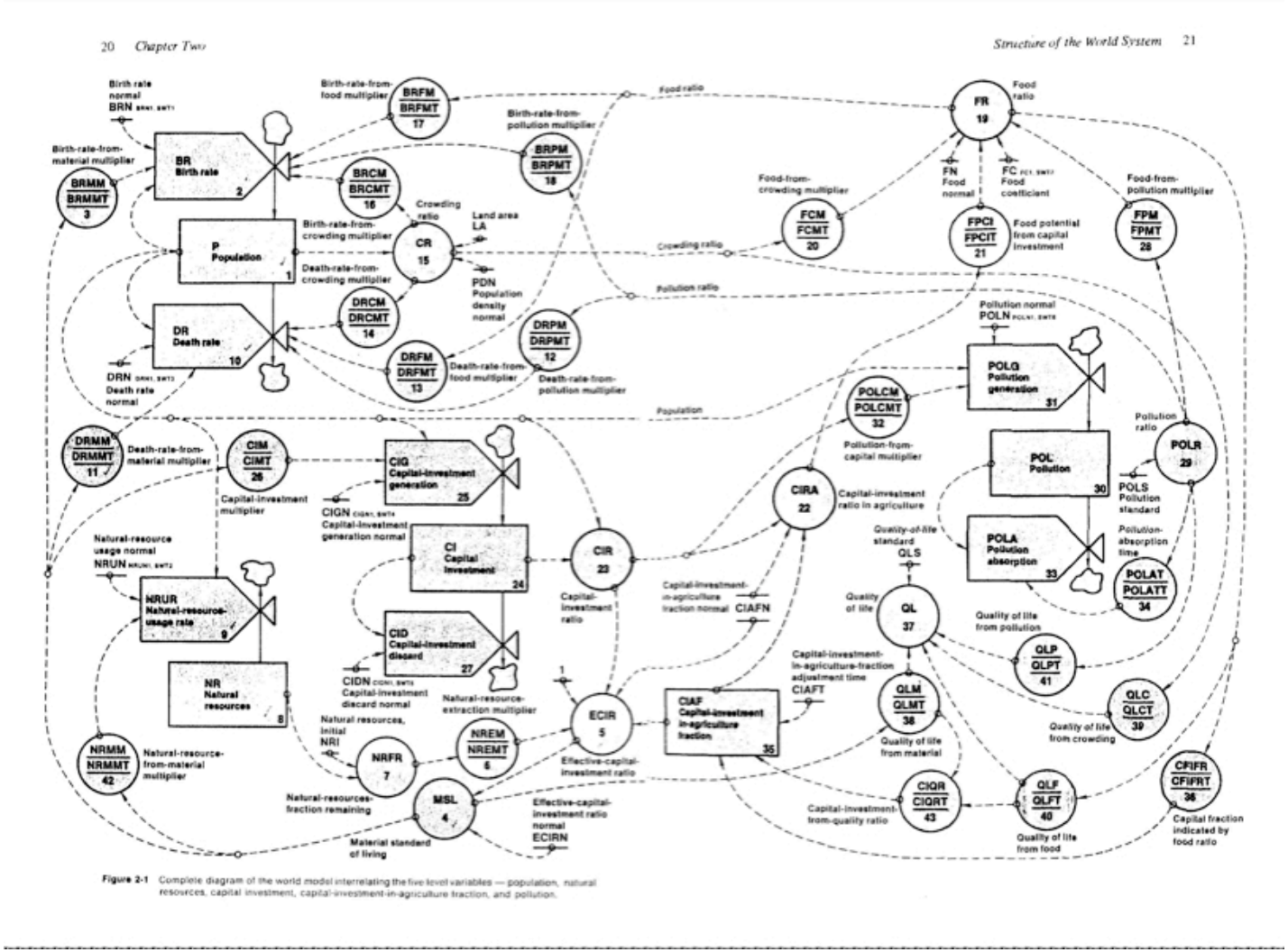
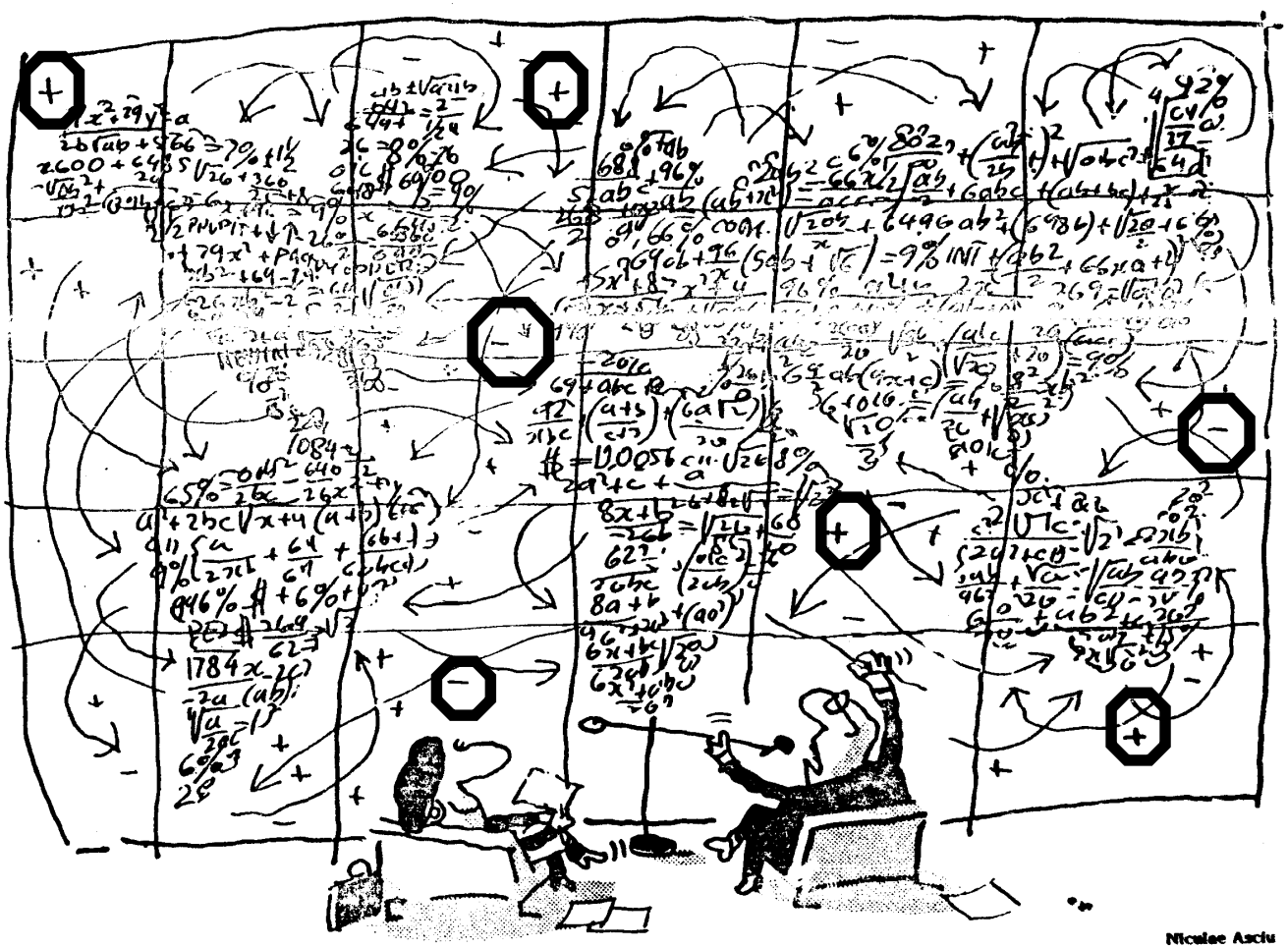


Figure 2-1 Complete diagram of the world model interrelating the five level variables — population, natural resources, capital investment, capital-investment-in-agriculture fraction, and pollution.

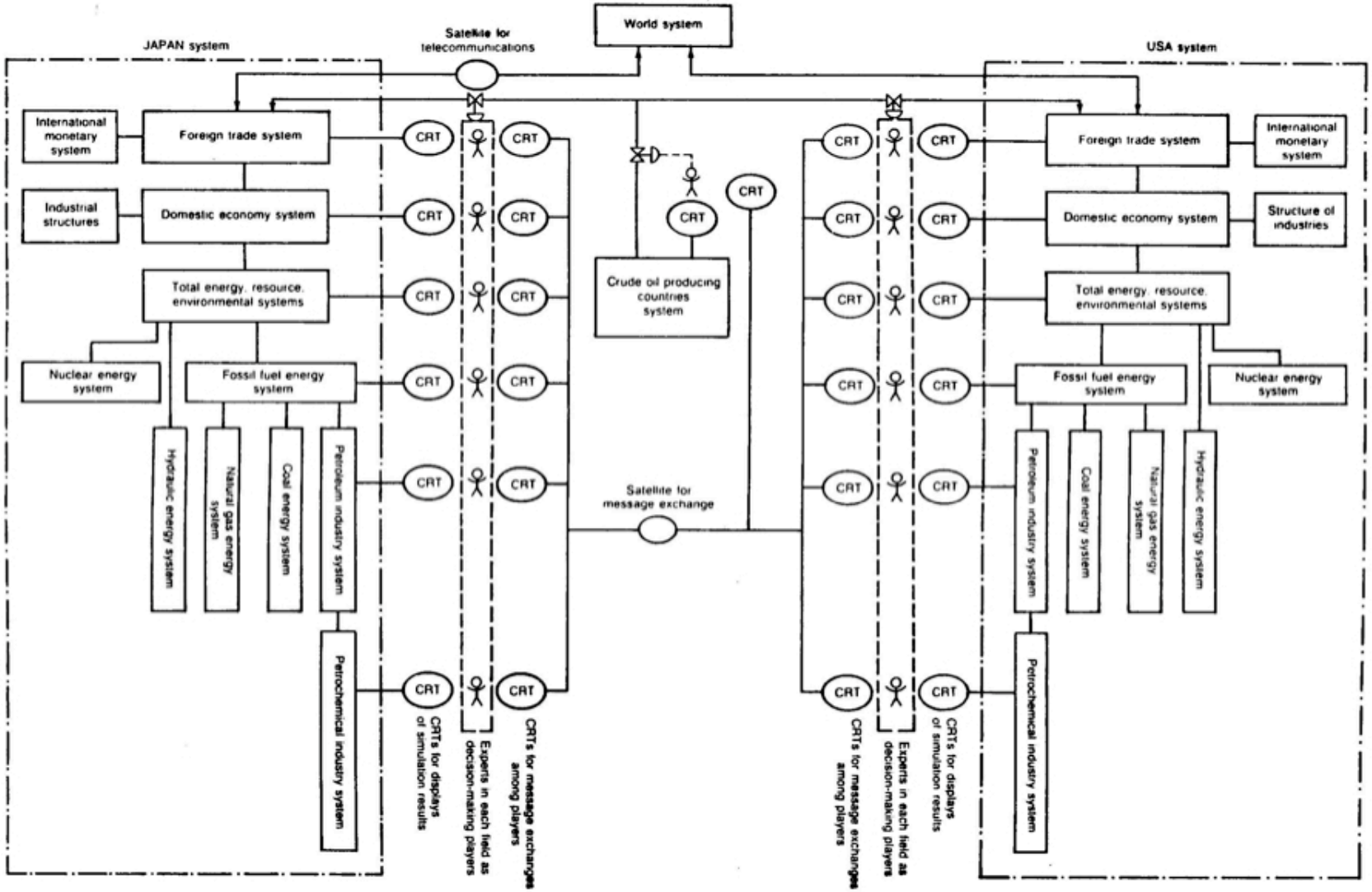
Systems Analysis of the World



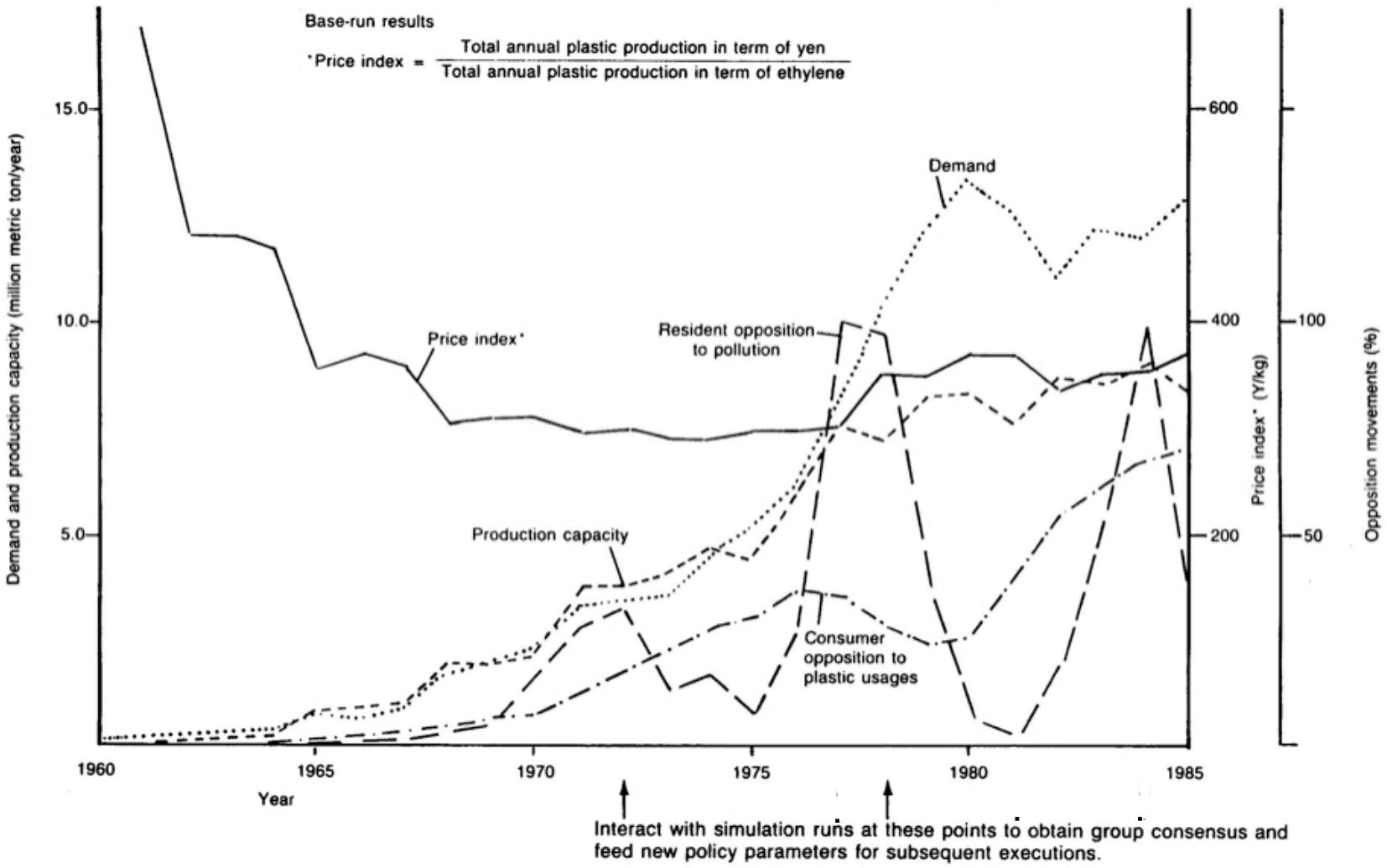
THE NEW YORK TIMES, SUNDAY, APRIL 6, 1986

Globally Collaborative Environmental Peace Gaming (GCEPG)

Structure of Integrated Models and Communication Network
Boxes are dispersed, dissimilar computers around the global Internet.



Growth of Japanese Petrochemical Industry



Globally Collaborative Environmental Peace Gaming through Global Neural Computer Network

- Need: Kyoto Protocol
- Computer Simulation Models
  - Socio-Economic-Environment Model
  - Climate Simulation Model
- Beowulf Mini Supercomputer
  - Maui Community College in Hawaii
- Global Neural (Grid) Computer Network

Vice President Al Gore

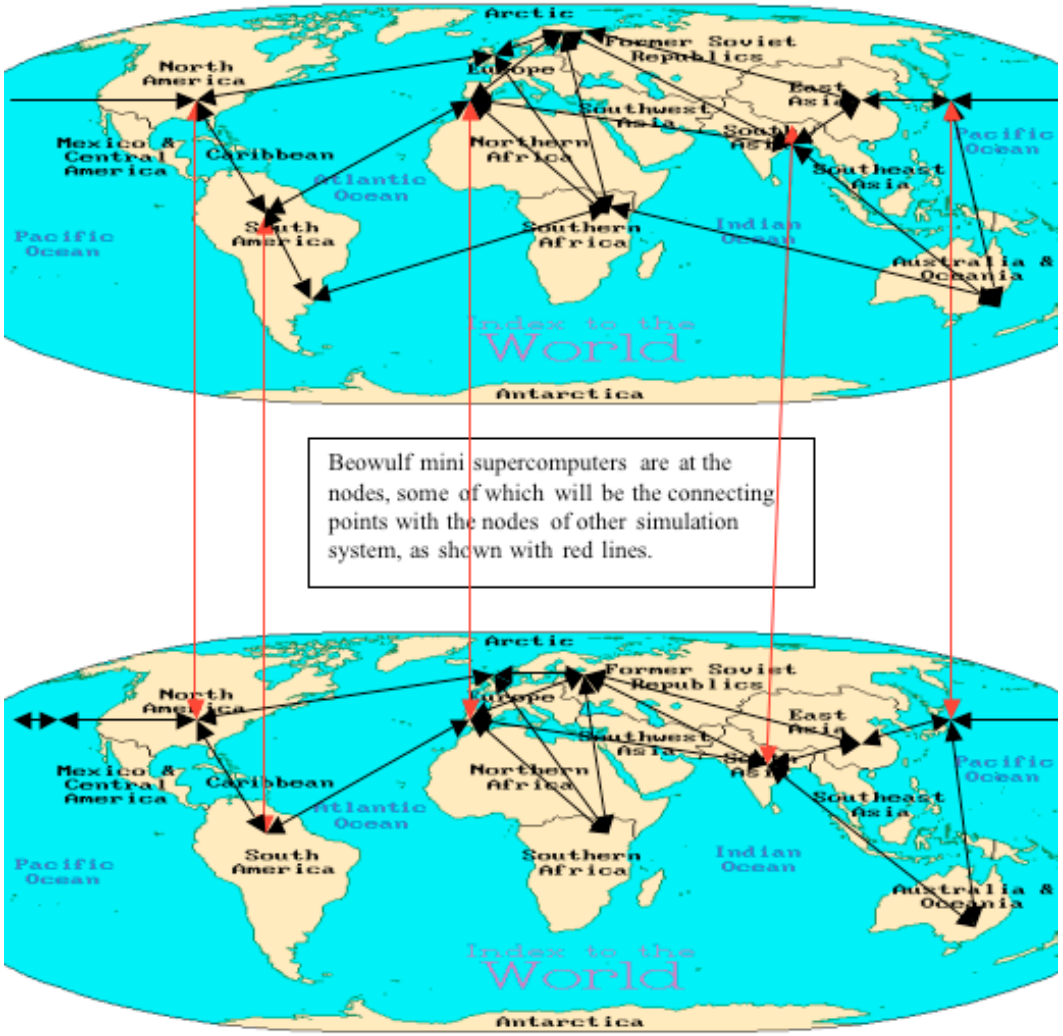
“The Department of Defense is investing well over $1 billion in the development and implementation of networked distributed interactive simulation.

This technology, which allows dispersed learners to engage in collaborative problem solving activities in real time, is now ready for transfer to schools and workplaces outside of the defense sector.”

January 11, 1994
Speaking to communications industry leaders

Globally Collaborative Environmental Peace Gaming (GCEPG)

Globally Distributed Climate Simulation System



Globally Distributed Socio-Economic-Environmental Simulation System

Enabling Distributed Learning Communities Via Emerging Technologies #1

Dr. Chris Dede, Harvard University
T.H.E. Journal, September, 2004

"Distributed learning" is a term used to describe educational experiences that are distributed across a variety of geographic settings, across time and across various interactive media.

Enabling Distributed Learning Communities Via Emerging Technologies #2

Dr. Chris Dede, Harvard University
T.H.E. Journal, September, 2004

A culture of learning in which everyone is involved in a collective effort of understanding. Its four characteristics are;

- **Diversity of expertise among its members who are valued for their contributions and given support to develop,**
- **A shared objective of continually advancing the collective knowledge and skills,**
- **An emphasis on learning how to learn, and**
- **Mechanisms for sharing what is learned.**

This is a radical departure from the traditional view of schooling, with its emphasis on individual knowledge and performance, and the expectation that students will acquire the same body of knowledge at the same time.

Enabling Distributed Learning Communities Via Emerging Technologies #3

Dr. Chris Dede, Harvard University
T.H.E. Journal, September, 2004

To fully prepare students for 21st century work and citizenship, the education system must transform to provide support for inquiry-based learning in classrooms, in homes and in communities since this is how complex skills such as systems thinking, creativity and collaborations are acquired.

Problems Solved or To Be Solved

- Need for interconnection of dissimilar models.
- Interconnection of distributed databases.
- Integration of simulation models and databases.
- Advanced programming languages.
- Synchronous and asynchronous communication networks.
- Rollback mechanism for asynchronous scheduling.
- Its integration with global economic and other forecasting submodels.

Future Steps of Global Development

- Evolution of distributed gaming simulations, as splitting each country submodel of FUGI to its country expert and location,
- Globally distributed computer simulation system,
- Emergence of a public database of existing submodels,
- Interface of these dissimilar submodels.

Unavoidable Conditions of Global Peace Gaming

- Time difference among game players due to the roundness of globe
- Latency of signal of distributed simulation models to/from geo-synchronous satellite
- Head-scratching time of game players for democratic decision-making with consensus

GCEPG and ELeGI Projects

GCEPG project could be a complete and powerful demonstrator of ELeGI Project to show:

1. **the advantages coming from using advanced technologies (i.e., GRID for accessing to computing resources and collaboration environments) for supporting simulations execution, data analysis, etc., and**
2. **simulations for learning through the definition of innovative pedagogical models (i.e., socio-constructivist contextualized learning approach), and**
3. **to show all the benefits coming from the harmonized and synergistic use of advanced technologies together with innovative pedagogical models for learning (i.e., ELeGI).**

Financing

- During the Okinawa Summit in July of 2000, Japanese government pledged US$15 billion to close the digital divide in developing countries and for the eradication of poverty and isolation.

- During the G8 Summit in Canada in June of 2002, and at the Environment Summit in South Africa in September of 2002, they also pledged another US$2 billion to aid education and healthcare in developing countries, respectively.

Financing
(continued)

- GUS projects will combine (1) the Japanese government's Official Development Assistance (ODA) funds and (2) Japanese electronic equipment with
- (a) the Internet technology and (b) content development of North America and Europe,
-
- to help underserved people in rural and remote areas of developing countries by closing the digital divide.

Conclusions

Clearly, our GCEPG Project is ambitious due to its scope and nature. Any one group, university, or national government cannot achieve it. The program will however need substantial collaborative contribution of ideas, expertise, technology resources, and money from multiple sources.

We invite those who value the vision of this Globally Collaborative Environmental Peace Gaming Project to join us in this urgently necessary project for human survival.

COMPUTER SIMULATIONISTS OF THE WORLD UNITE!!

Tak Utsumi, December 2003

To build:

Global Neural (GRID) Computer Network

For:

Globally Distributed Decision Support System

With:

Globally Distributed Peace Gaming Simulation

GLOSAS Projects

(GLObal Systems Analysis and Simulation Association in the U.S.A.)

Takeshi Utsumi, Ph.D., P.E.

- **Chairman, GLOSAS/USA**
- **Laureate of Lord Perry Award for Excellence in Distance Education**
- **Founder and V.P. for Technology and Coordination of Global University System (GUS)**
- **http://www.friends-partners.org/GLOSAS/**

Click "Current Reference Websites" in the home page listed above.

Three Arts

医術: Art of Medicine

To heal illness of individual human

仁術: Art of Wisdom/Virtue

To heal illness of nation and globe

武術: Art of Peace-Making

To attain global peace

武: 戈 (sword) + 止 (stop) = Peace

士: Samurai = Chivalry

武士: Takeshi = Chivalry of Peace