

# International Technology Assessments

World Technology Evaluation Center (WTEC), Inc.

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## Why do International Assessments?

- Look for good ideas abroad (tech transfer)
- Look for opportunities for cooperation
- Justify a reasonable investment in research
- Compare U.S. R&D status with foreigners
  - GPRA
  - “Maintaining world leadership” goal
  - How are we doing?

# Quantity and Quality

Papers in all Fields, 1981-1998

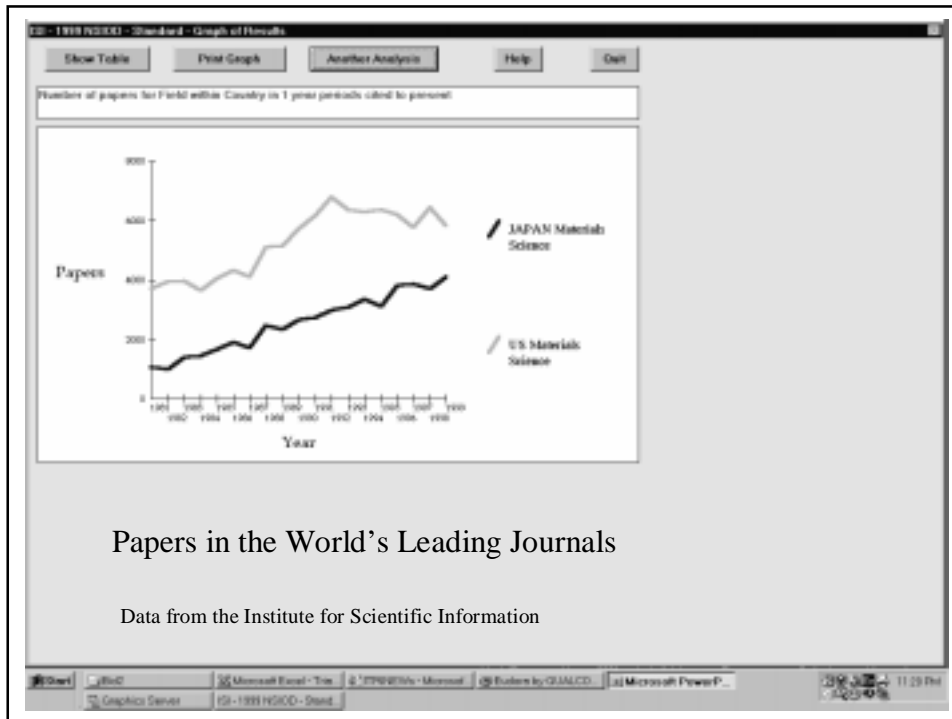
## Japan

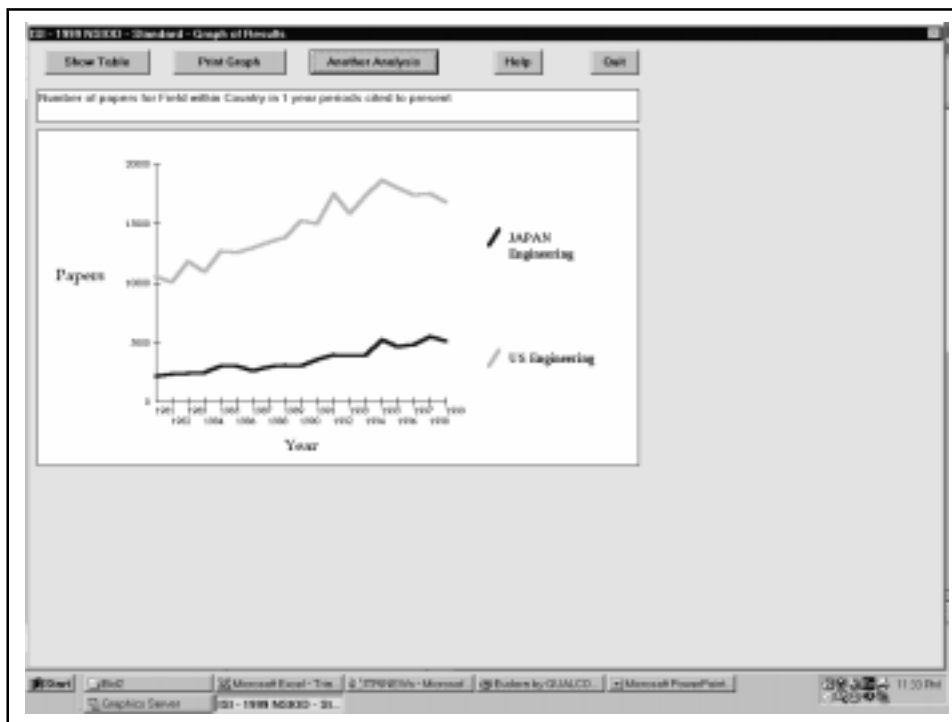
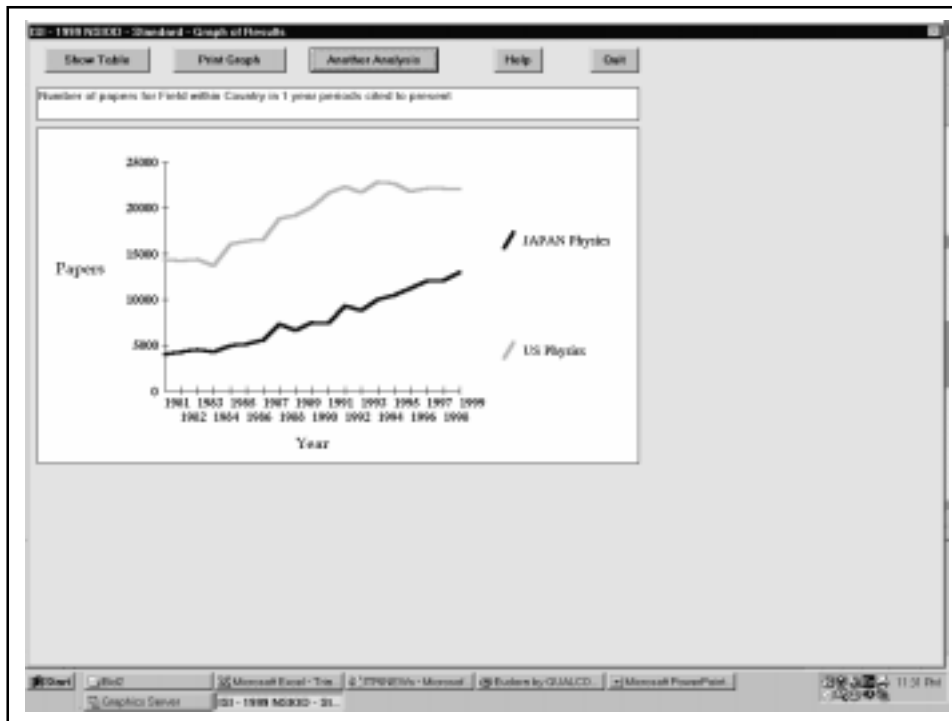
- Total Production  
(percent of world share)  
6.2% ↗ 9.5%
- High-impact (citation)  
106 ↗ 255  
(a 141 % increase)

## United States

- Total Production  
(percent of world share)  
40% ↘ 35%
- High-impact (citation)  
2942 → 2875  
(Declined)

Source: ISI Science Watch Nov/Dec 2000





## One Reason: Inadequate USG Funding of R&D in These Fields

- EE down 29% in real \$ (1993-1999)
- Physics down 24%
- Materials S&E up, but only 1.5%
- Doubling NIH will exacerbate this imbalance
- Source: *Trends in Federal Support of Research and Graduate Education 2001*,  
National Academy of Sciences, in press  
[www.nap.edu/books/0309075890/html/](http://www.nap.edu/books/0309075890/html/)

## WTEC Assessments Since 1989

- **Electronics** (11 fields assessed)
- **Materials** (9)
- **Computer Science** (5)
- **Telecommunications** (3)
- **Energy** (4)
- **Others** (14)

Full text of reports posted at <http://itri.loyola.edu>

## Recent Studies by Loyola / **WTEC**

- **Molecular Modeling, Westmoreland and Kollman**  
(NSF, DOE, NIST, NIH, ONR, DARPA)
- **Benign Manufacturing, Gutowski**  
(NSF)
- **Tissue Engineering, McIntire**  
(NSF, FDA, NIH, NIST, DARPA, et al.)
- **National Nanotechnology Initiative, Roco**  
(OSTP, NSTC)

## Studies Underway at **WTEC, Inc.**

- **Spin Electronics** von Molnar  
(NSF, DARPA, OSD, NIST, ONR)
- **Quantum Information Sciences** Loss, Awschalom  
(NSF, DARPA, ONR)
- **MEMS** Howe  
(NSF, DARPA, NIST)
- **Metabolic Engineering** (NSF Workshop)
- **Nano/Human Performance** (NSF Workshop)