

Rising Above the Gathering Storm Revisited: *Rapidly Approaching Category 5*

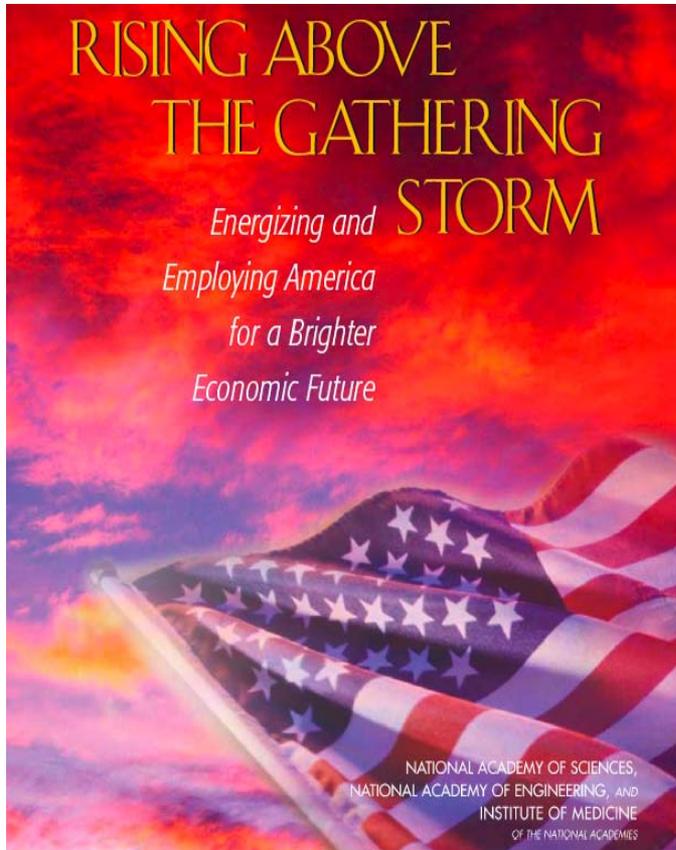
*President's Council of Advisors on Science and
Technology*

Charles M. Vest
President, National Academy of Engineering
President *Emeritus*, MIT

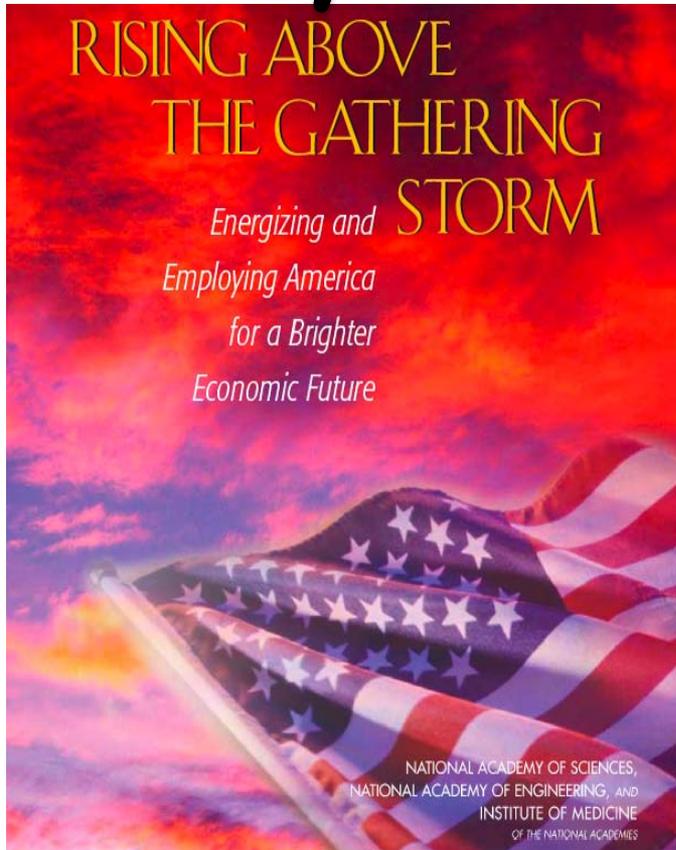
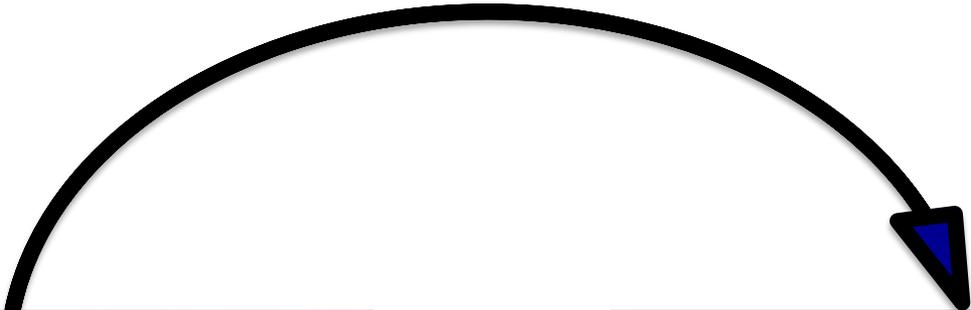
November 4, 2010

National Academies Recommendations

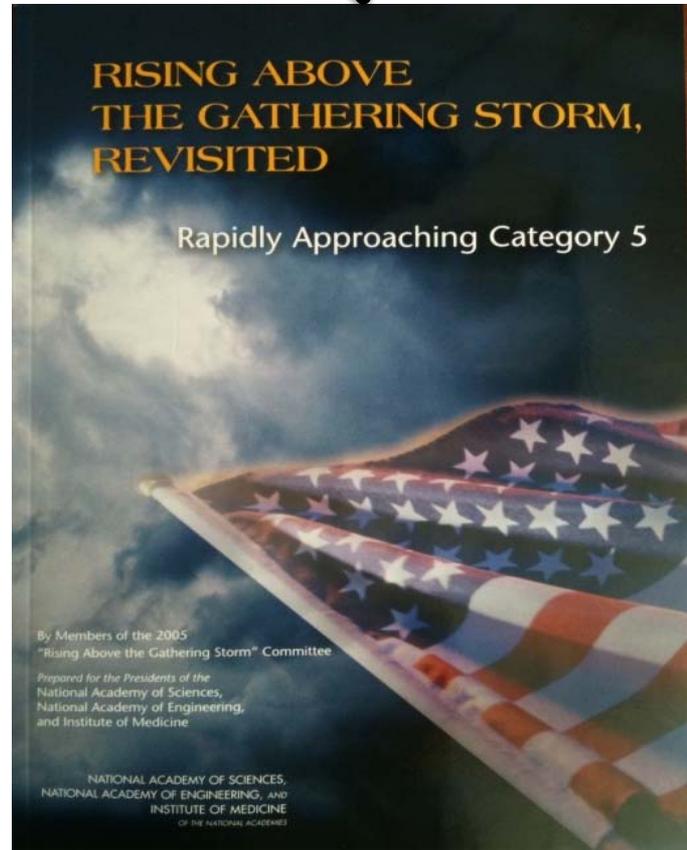
- A. 10,000 Teachers Educating 10 Million Minds:
K-12 Science and Mathematics Education
- B. Sowing the Seeds Through Science
and Engineering Research
- C. Best and Brightest in Science and Engineering
Higher Education
- D. Incentives for Innovation



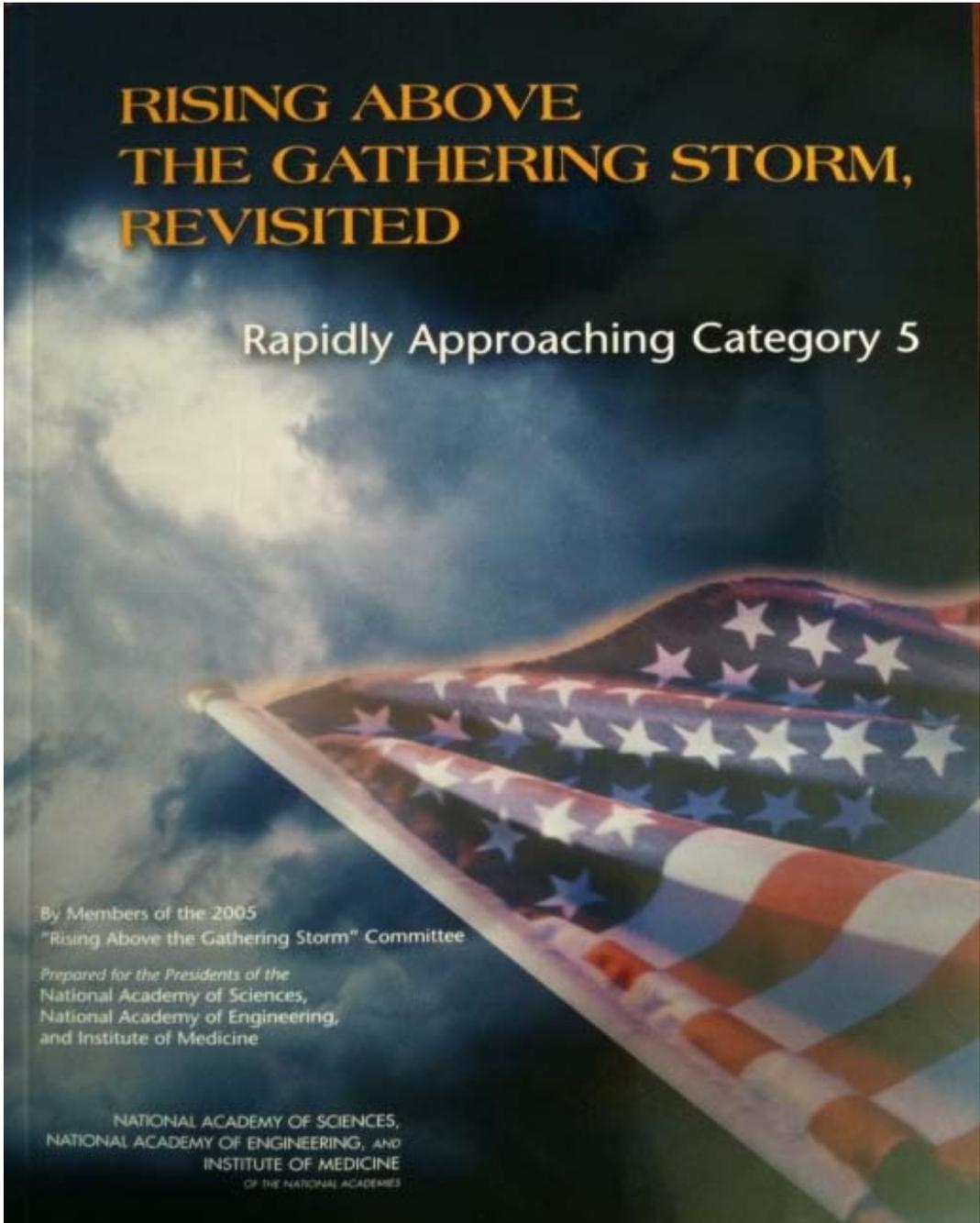
2005



2005



2010



RISING ABOVE THE GATHERING STORM, REVISITED

Rapidly Approaching Category 5

By Members of the 2005
"Rising Above the Gathering Storm" Committee

*Prepared for the Presidents of the
National Academy of Sciences,
National Academy of Engineering,
and Institute of Medicine*

NATIONAL ACADEMY OF SCIENCES,
NATIONAL ACADEMY OF ENGINEERING, AND
INSTITUTE OF MEDICINE
OF THE NATIONAL ACADEMIES

**“Gentlemen, we have run out of money.
It is time to start thinking.”**

*Sir Ernest Rutherford,
Nobel Laureate (Physics)*

Filled with Fact-checked Factoids

Followed by Pithy Perspectives

Painting an Unhappy Picture

But ...

We know what the problems are.

We know what most of the solution is.

The political will must be established.

RISING ABOVE THE GATHERING STORM, REVISITED

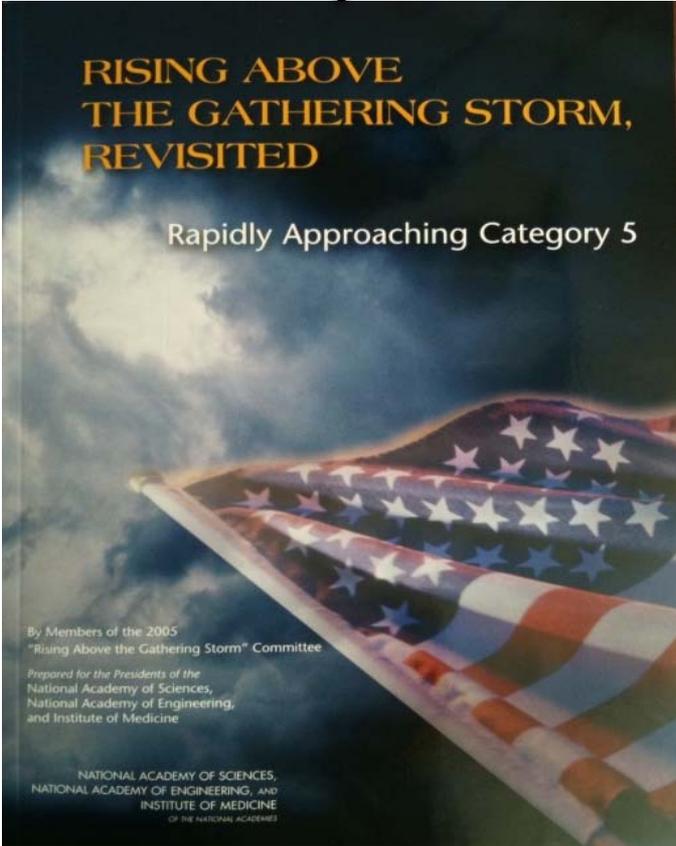
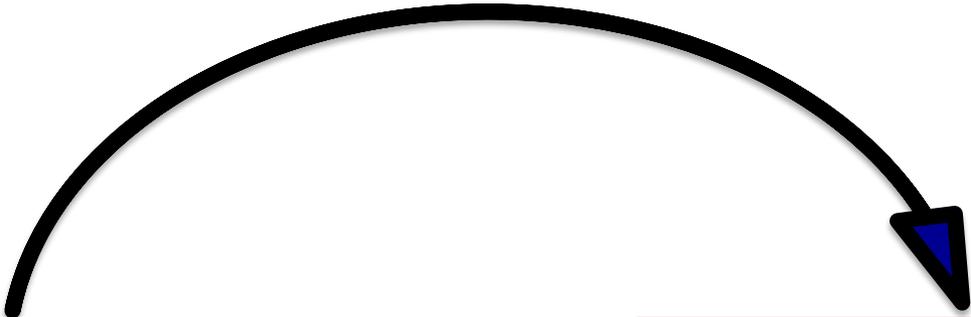
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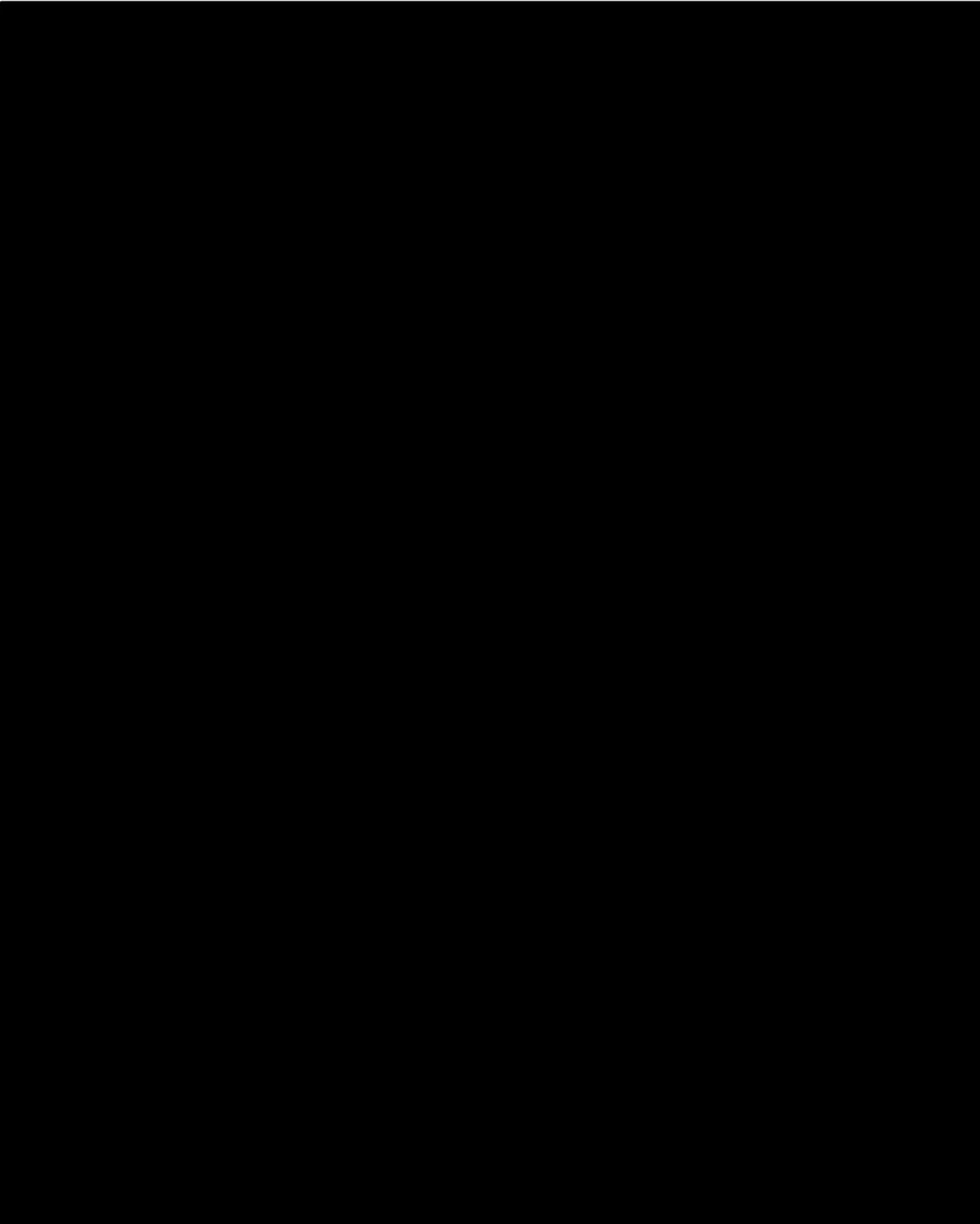
2010



2010



2015



**“Gentlemen, we have run out of money.
It is time to start drinking.”**

*Dr. John Holdren,
Presidential S&T Advisor*

RAGS Revisited

The need.

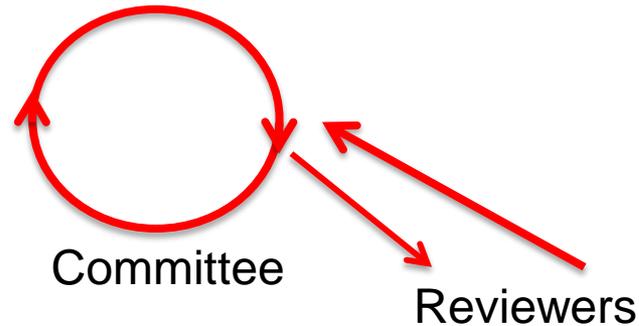
Requested by the NAS, NAE, and IOM
Presidents

The methodology

Review Process

Publication

Norm / NA Staff



Major Sections

1.0 The Gathering Storm Revisited

2.0 Efforts to Avert the Storm

3.0 Changing Circumstances

4.0 The Ingredients of Innovation

5.0 A Category 5 Storm

2.0 Efforts to Avert the Storm

Enhance K-12 Education: Fallen far short of RAGS recommendations

Strengthen Basic Research: Substantial, but funding seems tenuous going forward.

Other:

~~Increase H-1B Visas~~

~~Permanent R&D Tax Credit~~

~~Intellectual Property Laws~~

~~Export Control Reform~~

3.0 Changing Circumstances

New S&T university with \$10 billion endowment has been established.

>200,000 students will study abroad.

A new Innovation City is built for 40,000 people.

Create a global nanotechnology hub with 14 “world class universities.”

High-level commission patterned on RAGS established to create jobs

3.0 Changing Circumstances

Saudi Arabia

China

Russia

India

United Kingdom

3.0 Changing Circumstances

Global Challenges in a Global World

All nations face difficult challenges.

But most do not face the challenge of sustaining our lifestyle.

A nation that does not embrace innovation will soon be left behind in the 21st century economy.

4.0 The Ingredients of Innovation

Knowledge Capital

Survey: 80% of U.S. firms' CFOs would cut R&D to meet the next quarter's profit projections.

The U.S. ranks 5th in basic research as % of GDP.

Human Capital

The U.S. is 20th in high school graduation rate among industrialized nations.

Each year we graduate: 8,000 Engineering PhDs, 150,000 MBAs, and 44,000 Lawyers.

Women and minorities are still far behind in S&E enrollments.

Environment

Many gov't controlled factors strongly impact a nation's ability to create jobs in a competitive Marketplace.

U.S. democracy and free enterprise are great advantages, but also self-imposed disadvantages.

5.0 A Category 5 Storm

A Tale of Two Job Seekers

Candidate A: Lower quartile of class
Expects \$17 per hour

Candidate B: Near top of class
Speaks two languages
Eager for \$1.50 per hour

Trends in Competitiveness

Our higher education system is being seriously challenged.

Our Real growth rate is -2.6%.

Overall Assessment

Overall Assessment

In balance, it would appear that overall the United States long-term competitiveness outlook (read jobs) has further deteriorated since the publication of the Gathering Storm report five years ago.

National Academies Recommendations

- A. 10,000 Teachers Educating 10 Million Minds:
K-12 Science and Mathematics Education
- B. Sowing the Seeds Through Science
and Engineering Research
- C. Best and Brightest in Science and Engineering
Higher Education
- D. Incentives for Innovation

Responses

- A. 10,000 Teachers Educating 10 Million Minds:
K-12 Science and Mathematics Education
No real implementation
- B. Sowing the Seeds Through Science
and Engineering Research
Substantial Progress, ... but sustained?
- C. Best and Brightest in Science and Engineering
Higher Education
Far short.
- D. Incentives for Innovation
Nothing much new.

Closing (Personal) Comment

We are in a very serious strategic Crisis.

This is the most exciting era in human history for Science and Engineering.

We have democracy, free enterprise, diversity, and a stunning history.

It is time to be great again.