Remaining Relevant in a Time of Uncertainty

American Institute of Physics

Assembly of Society Officers
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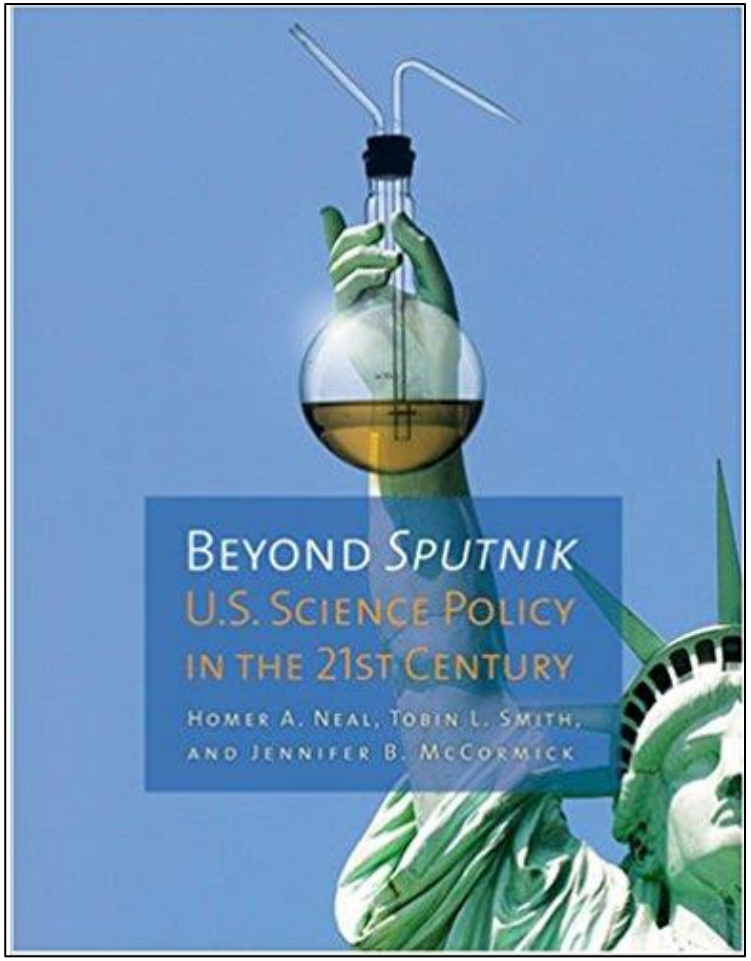
American Meteorological Society

Relevant?

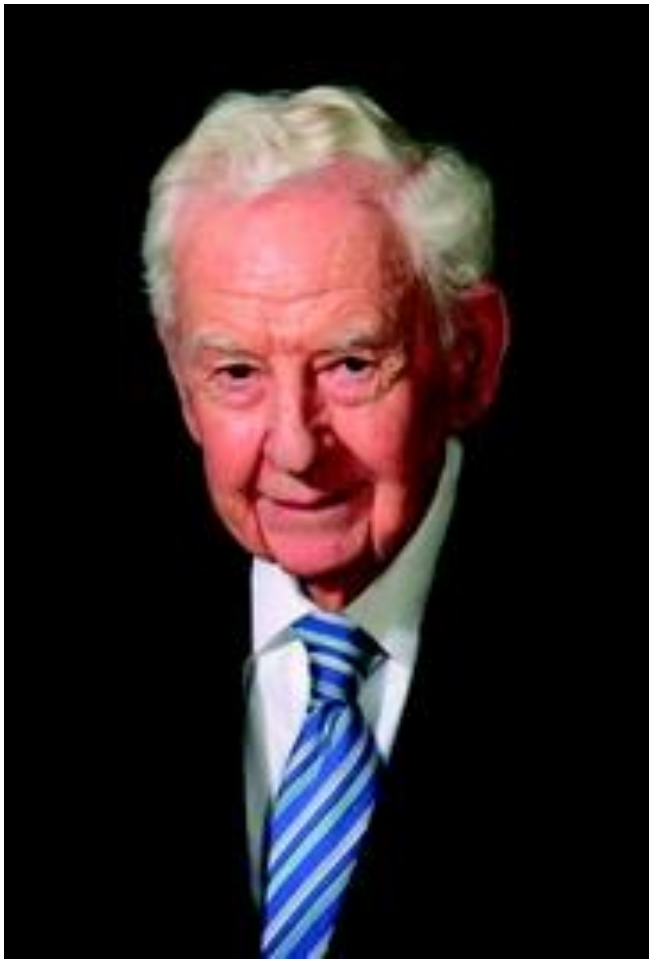
- ***Salient*: Relevant – with respect to <u>what matters</u>**
- ***Legitimate*: Relevant – with respect to policy, politics, and procedural <u>approach</u>**
- ***Credible*: Relevance – as a Societal <u>value</u>**

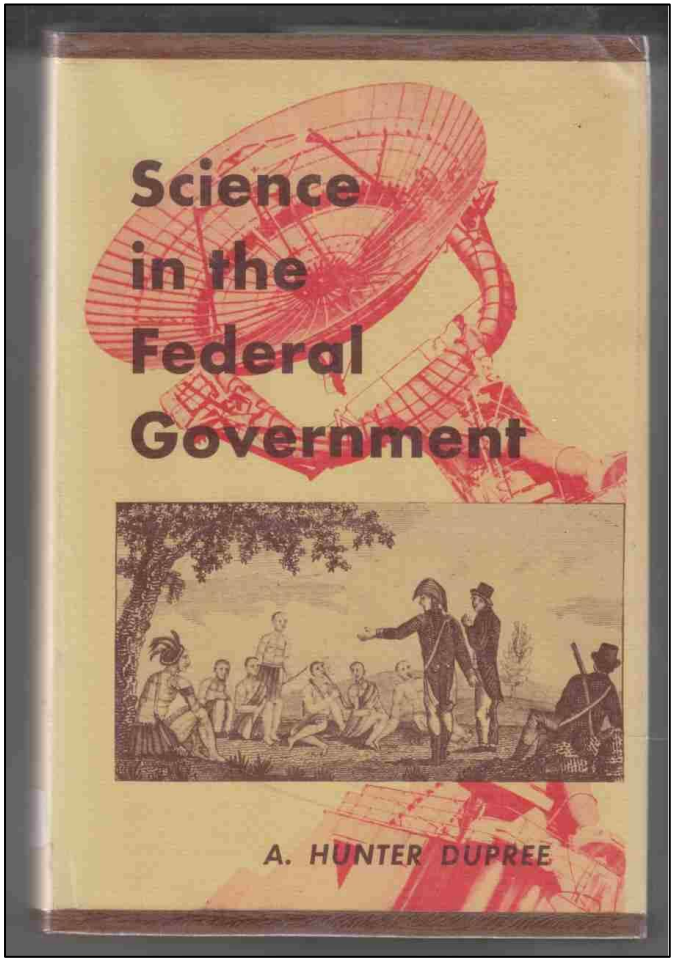
salient

U.S. science policy's "Big Bang"



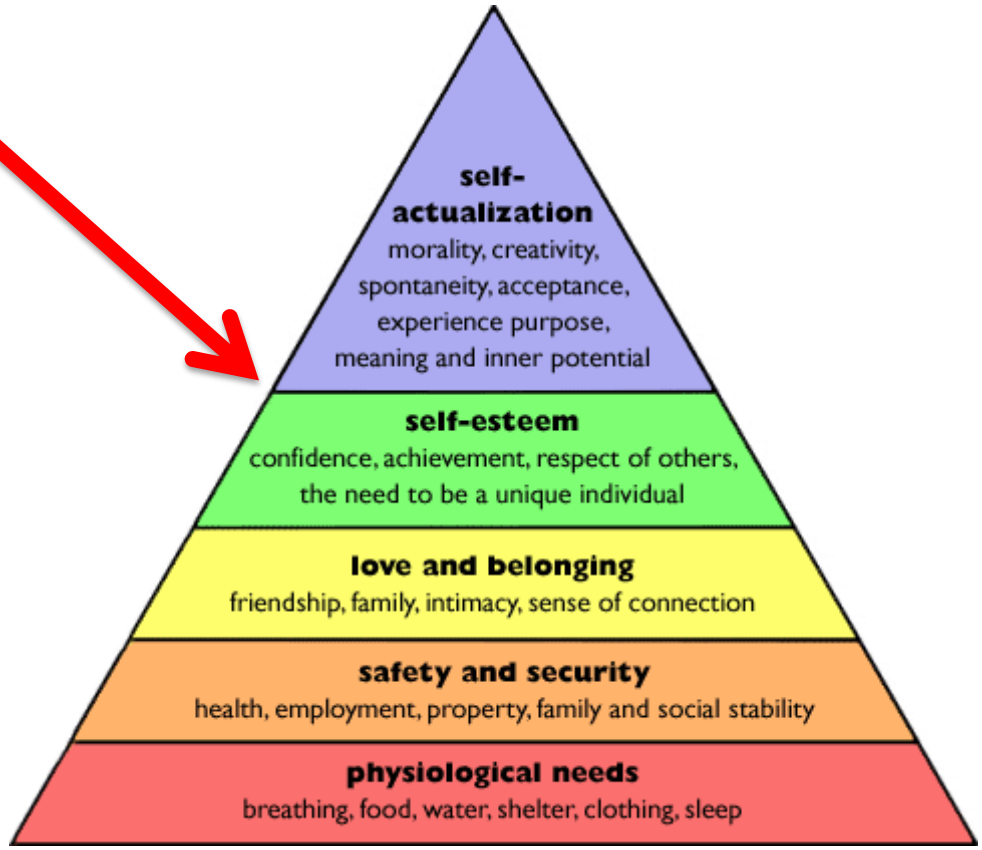
Before the “Big Bang”





Why was the Revolutionary War worth fighting?

- **Ideals of freedom, liberty, democracy**



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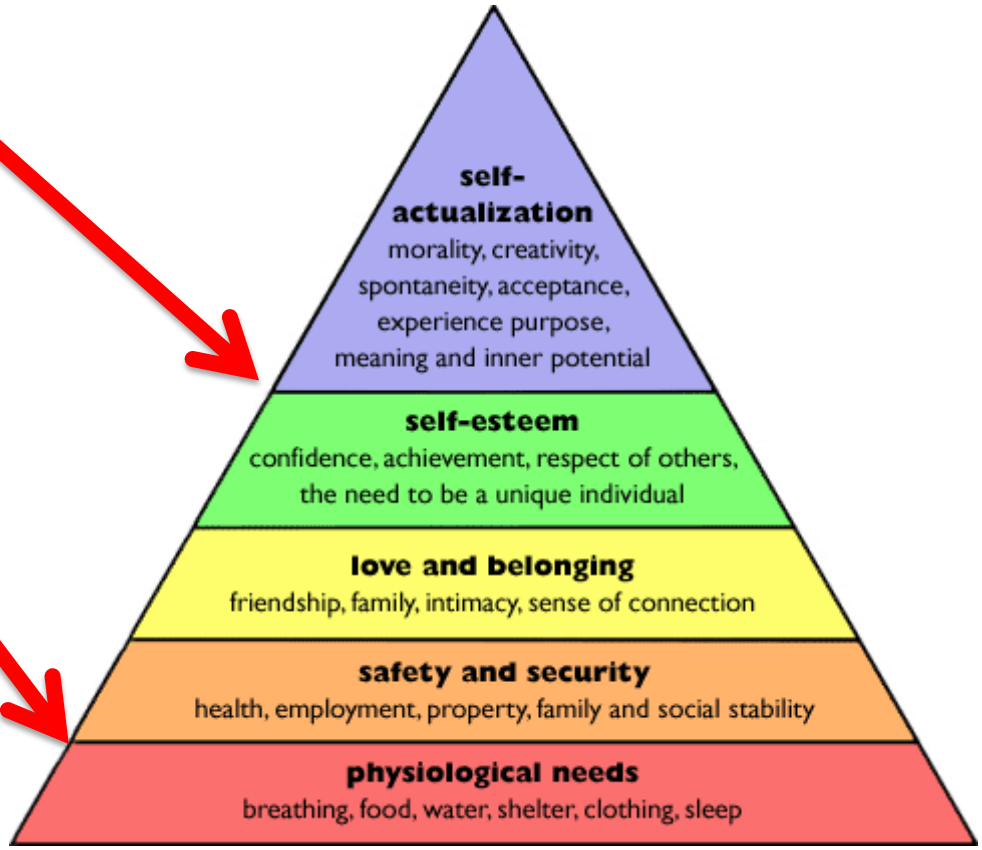
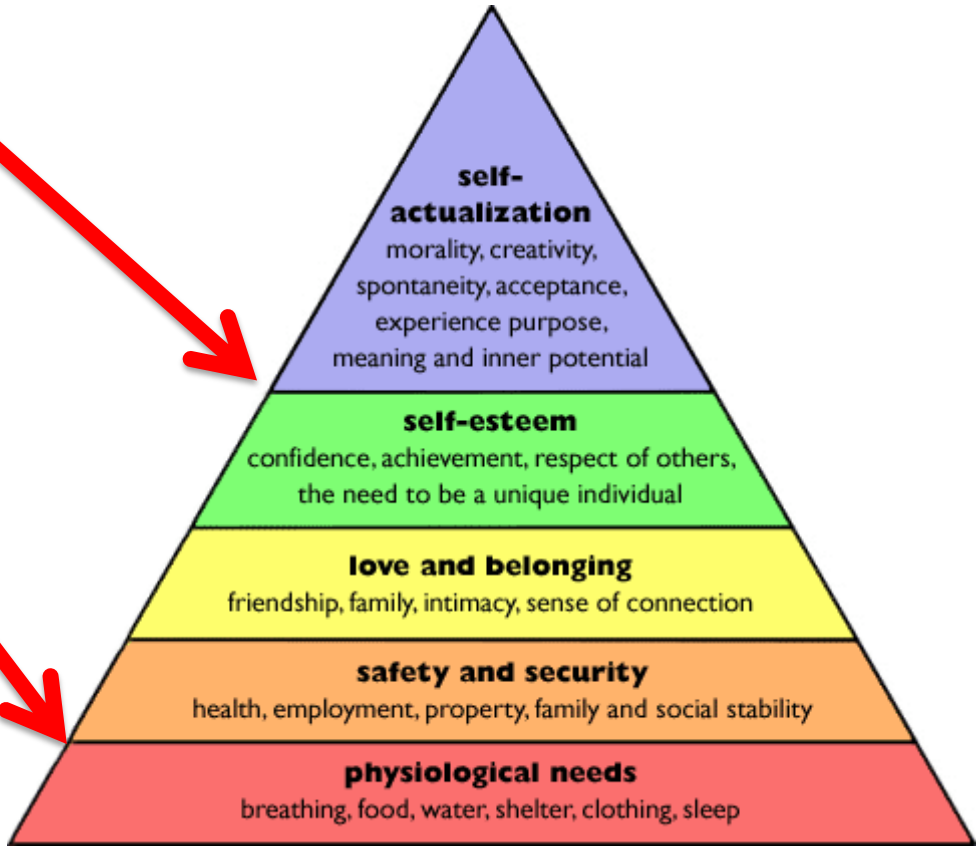
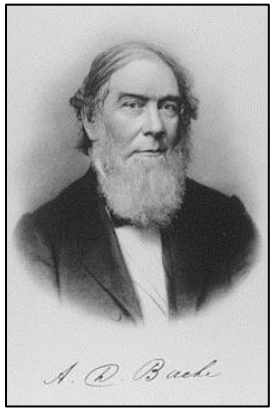


Why was the Revolutionary War worth fighting? What science would the new country need?

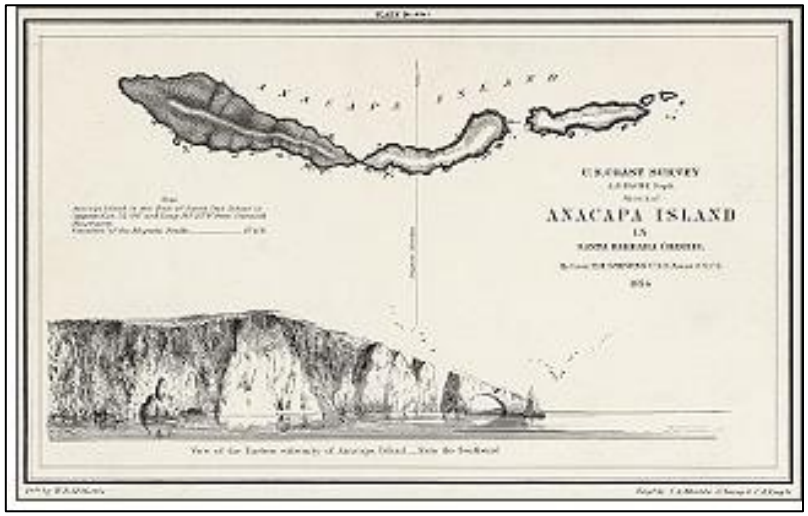
- Ideals of freedom, liberty, democracy
- A vast land, rich in natural resources
- An immediate need: critical infrastructure

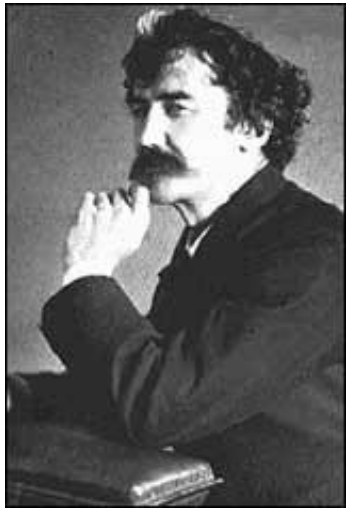


U.S. Military Academy – 1801



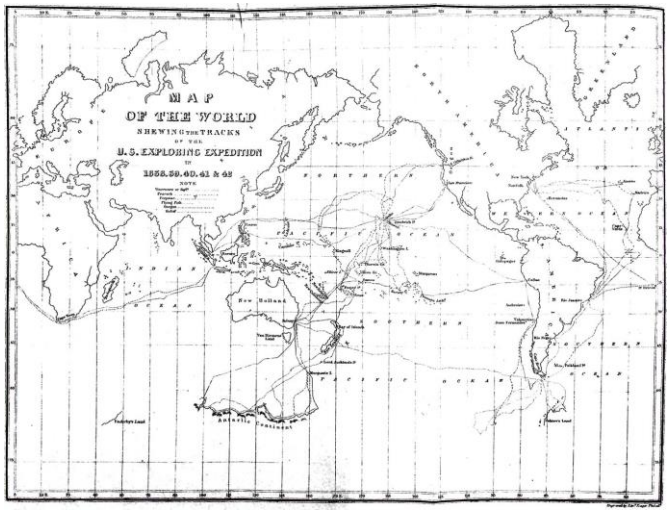
U.S. Survey of the Coast -- 1807





Great expeditions

- Lewis and Clark 1804-1806
- Zebulon Pike 1806-1807
- Charles Wilkes 1838-1842
- John Wesley Powell 1869



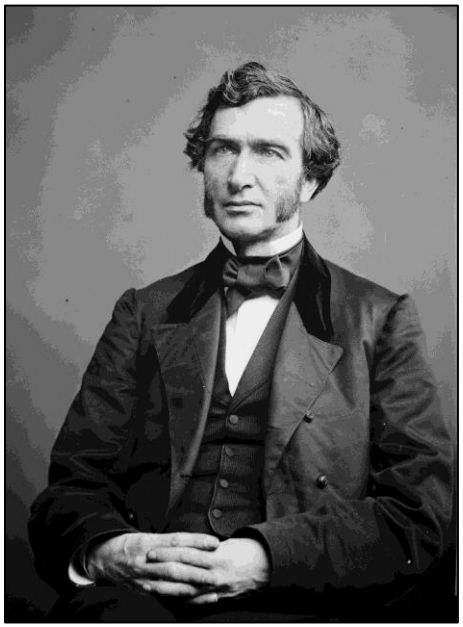
America's science NGO's

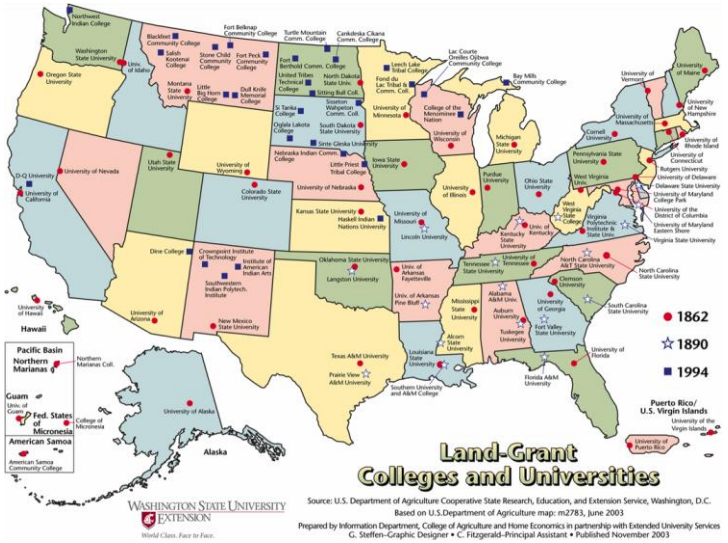
- American Philosophical Society 1743
- Smithsonian 1846
- AAAS 1848
- National Academy of Sciences 1863

- AGU, AMS,... 1919

"While science is without organization, it is without power."– Alexander Dallas Bache, 1851

the Morrill Act

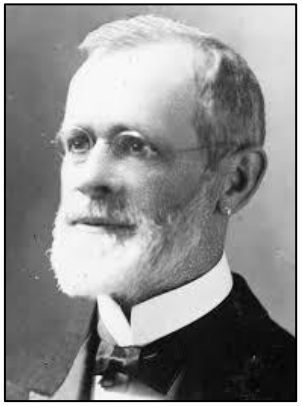


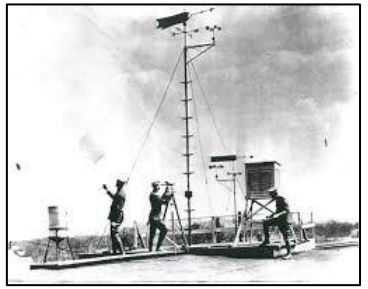


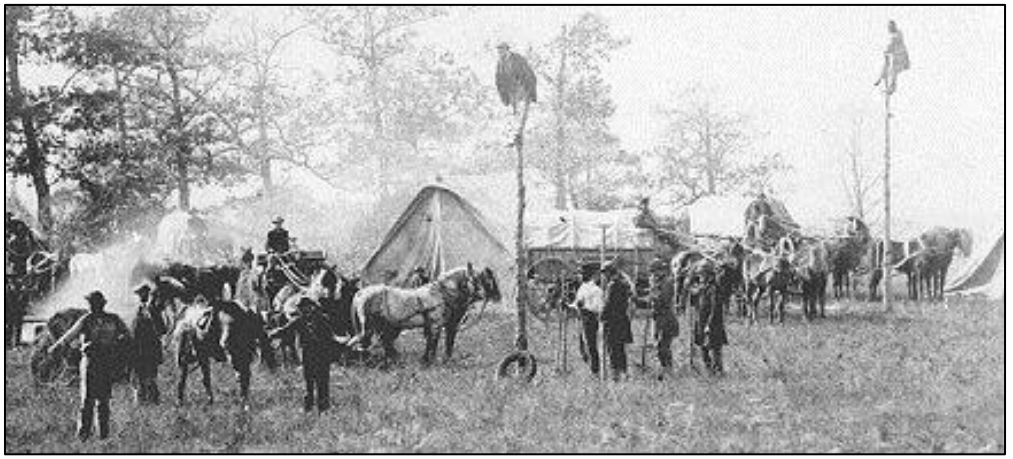
- *"**An Act** Donating Public Lands to the Several States and Territories which may provide Colleges for the Benefit of Agriculture and the Mechanic Arts,"*
- each state provided 30,000 acres of Federal land for each member in their Congressional delegation.

Post Civil-War science agencies

- **Army Signal Service 1860**
- **Navy Hydrographic Office 1866**
- **US Geological Survey 1879**
- **US Coast and Geodetic Survey 1878 (1807)**







Post-World-War II?

- (nuclear) physics
- Biology/bioengineering

- BUT ALSO

- Nuclear missiles → Earth satellites
- Radar → weather surveillance
- DNA research → GMO…

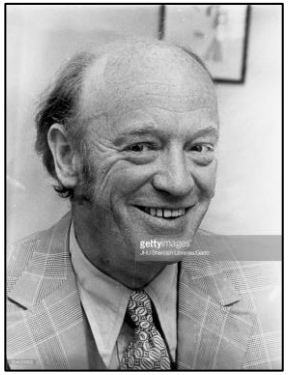
Post- "Big-Bang?"

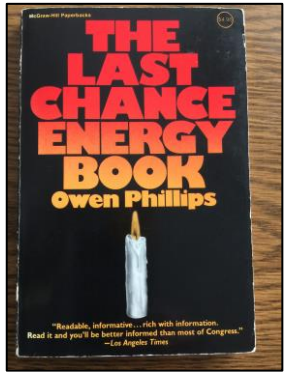
- **Challenges that formerly could be "solved" in isolation**
  - **Food/Water/Energy**
  - **Resources/Hazards/Environment**

  now have to be solved *simultaneously*
- **Require innovation/new tools**
  - **Observations**
  - **Big data/data analytics/cognitive computing/ quantum computing**
- **Once again: need for critical infrastructure**

Over the next 20 years, the world will spend $100T on critical infrastructure:

- Water infrastructure $25T
- Agricultural investment $15T
- Energy $50T
- Natural hazard losses $10T





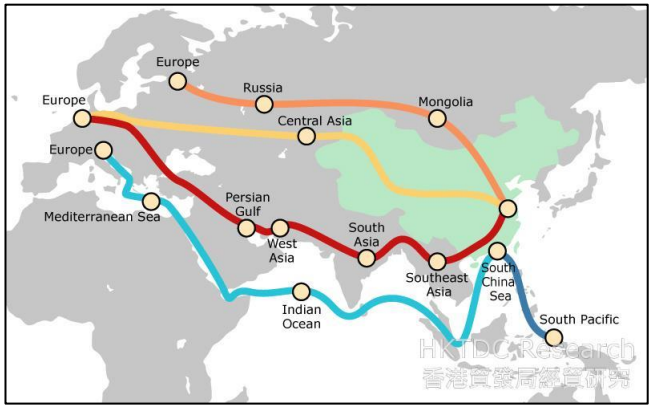
The world will lose between $4T-$20T in value of ecosystem services (by 2030)

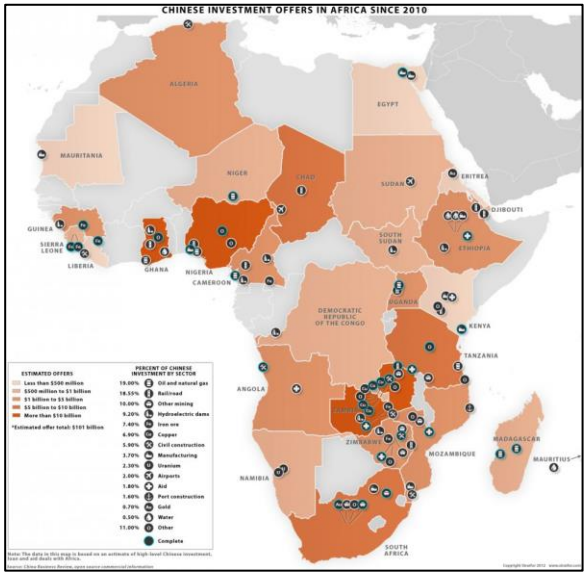
China is competing for this business

U.S. edge?

- Innovation, but also
- Societal benefit
  - Governance
  - STEM education
  - Funding
  - 3-fold solutions

Lost if we hit the "Pause" button

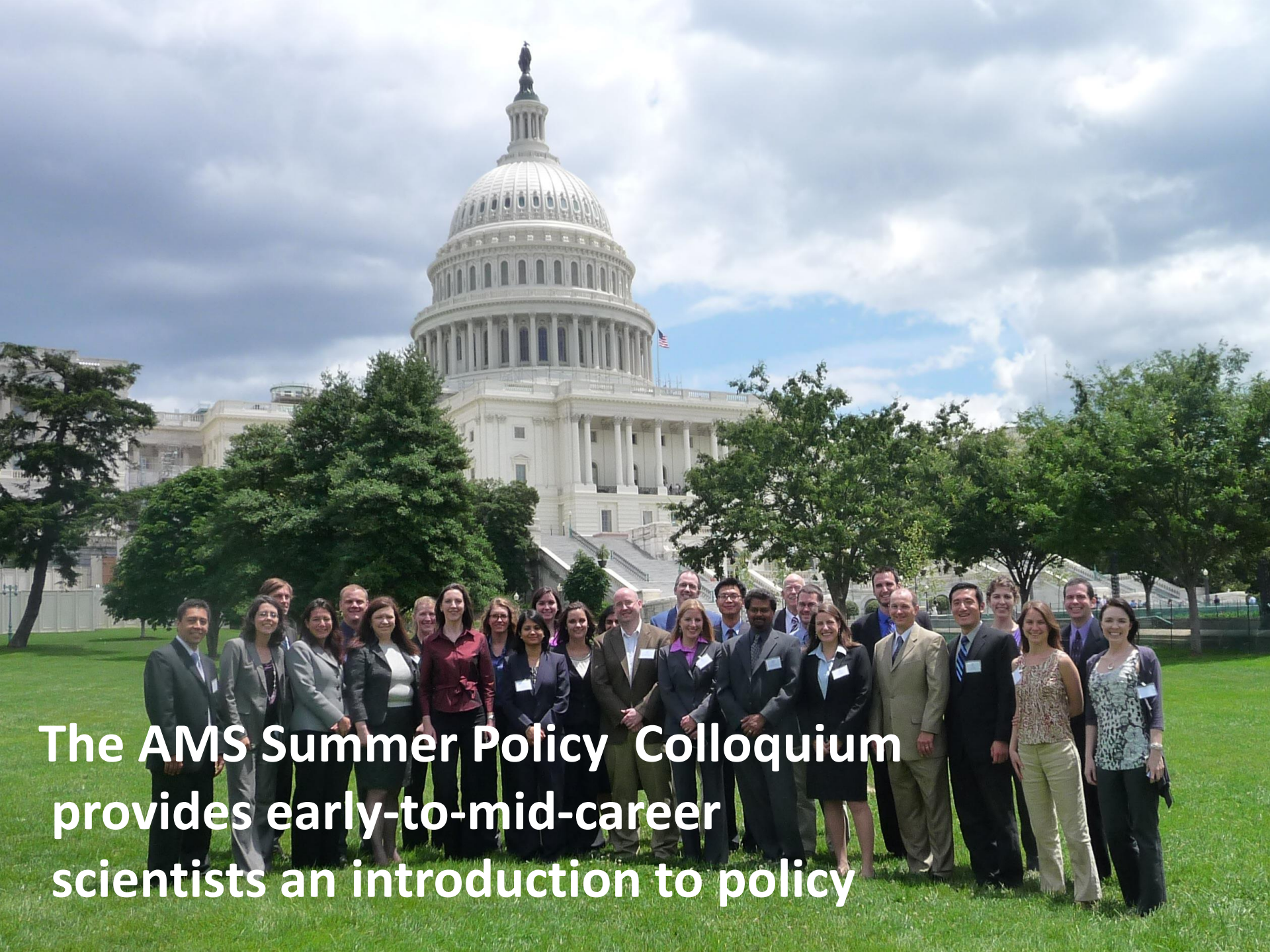




legitimate

- **Non-partisan**
- **Represent diverse views**
- **Government employees/no advocacy**

- **AMS statements; AIP statements…**
- **CVD's**
- **AMS Summer Policy Colloquium**


The AMS Summer Policy Colloquium provides early-to-mid-career scientists an introduction to policy

AMS Summer Policy Colloquium

- An annual 10-day policy "boot camp" for scientists and engineers
- 2001-present
- 500 alumni, moving into leadership positions
- Pre-assigned reading
- Group exercises
- Diverse, high-level instructors
- Case studies
- Strongly positive individual evaluations
- NSF support about $150K/year

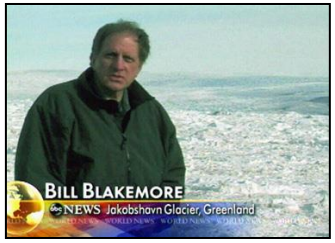
  (target: 10 students, 2 HBCU/MSI faculty)



















two paths to participation

- (30%) Competition for NSF support. (covers tuition, travel, hotel, meals)
  - Ten graduate students
  - Two HBCU/MSI faculty
  - March 31 application deadline
- (70%) Institution (agency, company, university) pays tuition ($5500) plus expenses

Colloquium follow-on activities

- **Alumni events at every AMS Annual Meeting**
  - **Network with alumni from other years**
  - **Engage international leaders, social scientists**
  - **Speakers**

- **Congressional Visit Days**
- **Other events/activities**

Next opportunity?

- June 4-13, 2017
- More information on the AMS website http://www.ametsoc.org/atmospolicy/index.html
- Or contact me: hooke@ametsoc.org

credible

- **The AMS Mission: The American Meteorological Society advances the atmospheric and related sciences, technologies, applications, and services for the benefit of society. [emphasis added]**

Lastly, I would address one general admonition to all; that they consider what are the true ends of knowledge, and that they seek it not either for pleasure of the mind, or for contention, or for superiority to others, or for profit, or fame, or power, or any of these inferior things; but for the benefit and use of life; and that they perfect and govern it in charity. For it was from the lust of power that the angels fell, from lust of knowledge that man fell; but of charity there can be no excess, neither did angel or man ever come in danger by it."

-- Francis Bacon