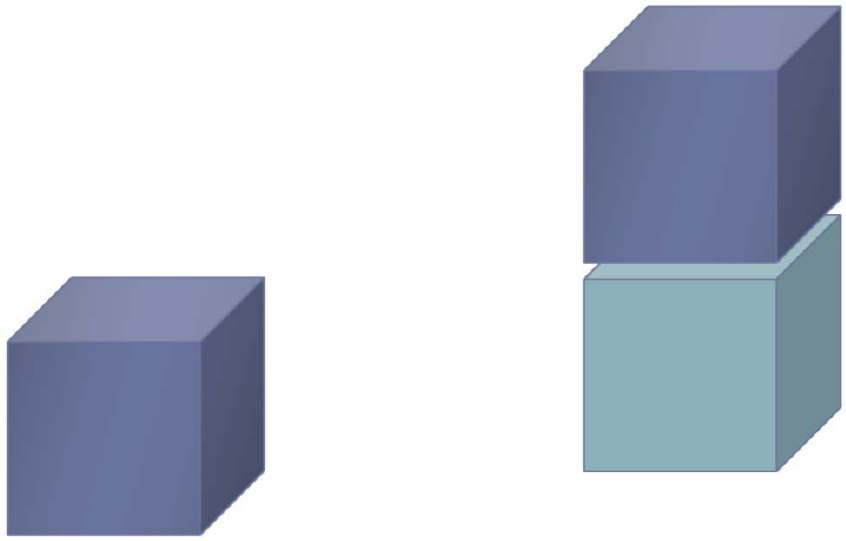
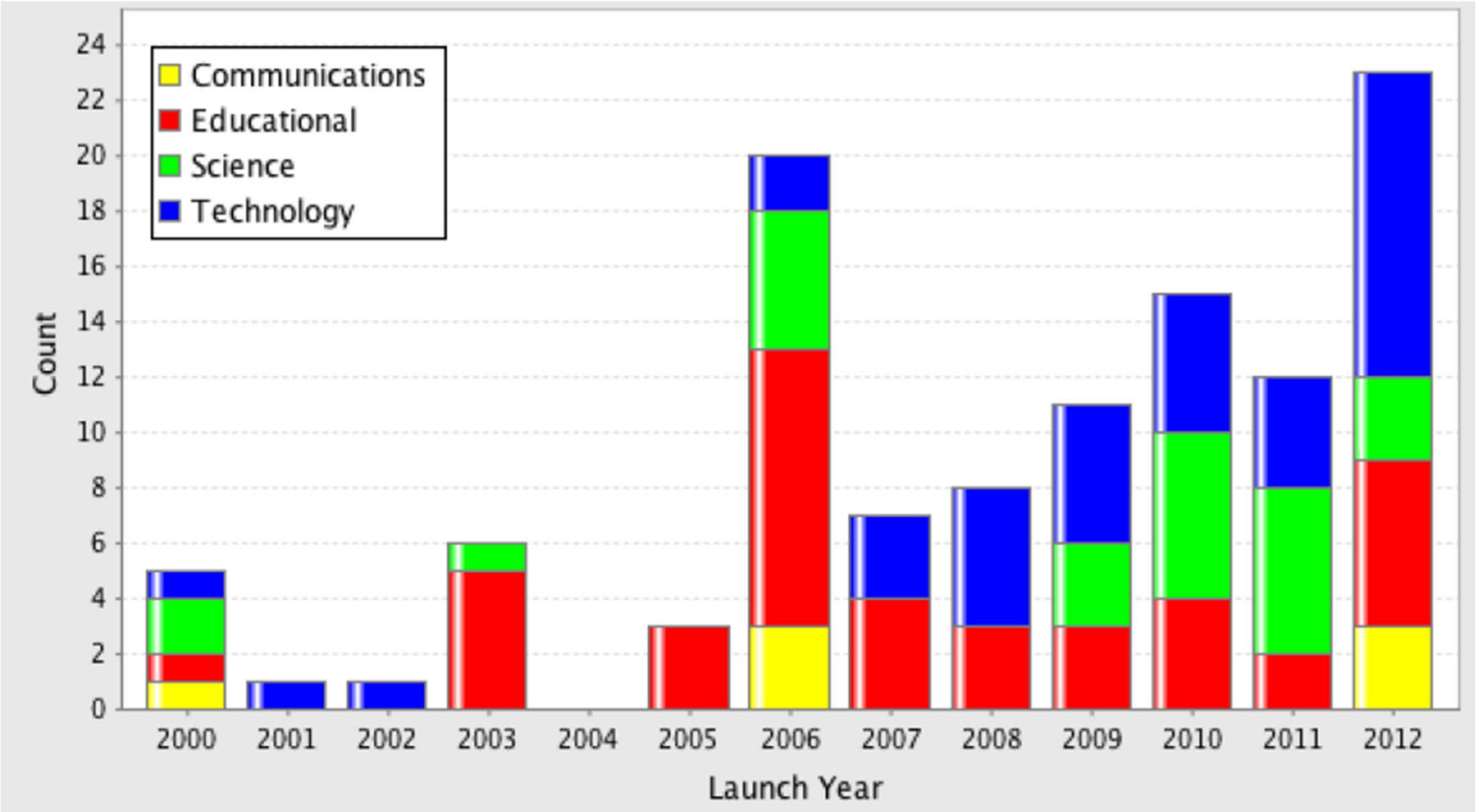


Achieving Science Goals with CubeSats

SSB Ad Hoc Committee
Chair: Thomas H Zurbuchen, University of Michigan
Study director: Abigail Sheffer, Program Officer, SSB



Swartwout, 2013: The First One Hundred CubeSats: A Statistical Look

Key Elements of Charge

- Review the current state of scientific potential and technological promise of CubeSats
- Review the potential of CubeSats as platforms for obtaining high-priority science data
  - From recent decadal reviews
  - Science priorities in 2014 NASA Science plan
- Provide a set of recommendations on how to assure scientific return on future federal agency support of CubeSat programs

Committee Actions

- Develop summary of status, capability, availability and accomplishments in government, academic and industrial sectors
- Recommend any potential near-term investments that could be made to
  - A) improve the capabilities that have a high impact and return
  - B) enable the science communities' use of CubeSats
- Identify a set of sample priority science goals that describe near-term science opportunities

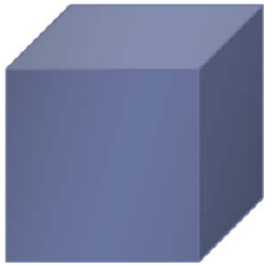
Work Plan

- Ad Hoc Committee has ~ 15 scientists and engineers
- Initial information gathering symposium of 1-3 days, and other input processes such as town hall meetings at conferences
- Meet as committee to further gather input and synthesize what is learned about
  - Status quo of CubeSats in research, innovation, education
  - Funding sources, programs, etc.
  - Enabling technologies, etc.
  - Evolutionary path of CubeSats, etc.
  - Limitations, barriers of this technology, etc.
  - Many more
- Anticipated completion Spring of 2016

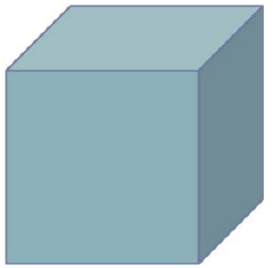
Name	Address
Thomas H. Zurbuchen	U of Michigan, Chair
Abigail Sheffer	NRC, Study Director
Stuart D. Bale	UC Berkeley
Andrew Clegg	Google
Bhavya Lal	IDA
Paulo Lozano	MIT
Malcolm Macdonald	University of Strathclyde
Robyn Millan	Dartmouth
Charles Norton	JPL
William H. Swartz	APL
Alan Title	Lockheed Martin
Thomas Woods	U Colorado
Edward L. Wright	UC Los Angeles
A. Thomas Young	Retired LMCO

Approach

- First meetings are focused on collecting data
  - CubeSat launches, successes etc.
  - Publication numbers, characteristics, etc.
  - Policy issues
  - Best science ideas for CubeSats today
  - Type of science addressed by CubeSats

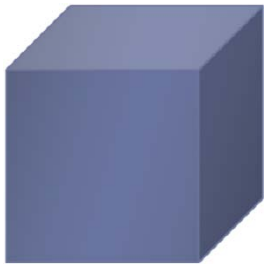


- Then, integration towards findings and recommendations



Meetings

- Meeting #1: June 20-21, 2015 in DC
  - NSF, NASA, DOD, USGS, NOAA statements
  - Policy issues: debris and communications
- Meeting #2: September 2-3, 2015 in Irvine
  - Community symposium
  - Science focus
  - Committee-only meeting on September 4
- Meeting #3: October 22-23, 2015
  - Focus on integration, recommendation
- Meeting #4: October 30, 2015
  - Policy focus
- Meeting #5: January 16-17, 2016 ISSI forum
  - International focus



What we want to learn this week

- The current state of scientific potential and technological promise of CubeSats
- The potential of CubeSats as platforms for obtaining high-priority science data
  - From recent decadal reviews
  - Science priorities in 2014 NASA Science plan
- Ideas on how to assure scientific return on future federal agency support of CubeSat programs. What are challenges that limit scientific return?

Inputs

- Talk to moderators and note takers. They will try to find you also at your posters.

- Or by Email to
  - Thomas Zurbuchen (thomasz@umich.edu)
  - Abby Sheffer (ASheffer@nas.edu)