Planetary Science R&A Program Update

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Committee on the Review of NASA's Planetary Science Division's
Restructured Research and Analysis Programs

May 12, 2016

Outline

- Why did we undertake the R&A restructuring?

  (J. Green covered this)

- How did we formulate & implement the restructuring?

- What are the outcomes to date?

How did we formulate & implement?

We had off-site retreats and many, many weekly meetings to formulate the plan

12/20/11 Findings from R&A Discipline Scientists Retreat (1/2)

- Organization of R&A programs is largely driven by historical precedent, and may not be the optimal structure in a budget-constrained environment.

- Research should be prioritized; non-research activities in portfolio (e.g., facilities, RPIFs, E/PO, workshops) should be evaluated.

- The 2011 Decadal Survey identified ***crosscutting scientific themes***; we recognized that these needed to be incorporated in our restructuring plan

How did we formulate & implement?

12/20/11 Findings from R&A Discipline Scientists Retreat (2/2)

- Have “core” (broad, on-going) research supplemented by “strategic” (on-going, but limited in scope) and “focused” (time-limited) research. Priority: Core>Strategic>Focused

- Core programs would maintain broad calls and perhaps have clustered reviews.

- Benefits include improving our alignment with division strategic goals and missions, more funding flexibility, maintaining excitement, modulating work load, smoother integration of new program officers, and eliminating redundant proposals.

Planetary Decadal Science Themes

Decadal Survey identified crosscutting themes

1. *Building New Worlds:* Advance the understanding of the initial stages, conditions, and processes of solar system formation including the formation and evolution of the Sun's family of planets, moons, and minor bodies.
2. *Workings of Solar Systems:* Advance the understanding of how the chemical and physical processes that shape our Solar System operate, interact, and evolve over time.
3. *Planetary Habitats:* Advance the understanding of the conditions sufficient for environments beyond the Earth to be capable of sustaining life.
4. *Potential for Life:* Advance the understanding of the origin and evolution of Earth's life and biosphere to guide our search for life elsewhere.
5. *Exploration:* Identify and characterize planetary objects and environments that pose threats to, or offer potential resources for, humans as we expand our presence into the Solar System.

SMD 2014 Science Plan

Ascertain the content, origin, and evolution of the solar system and the potential for life elsewhere.

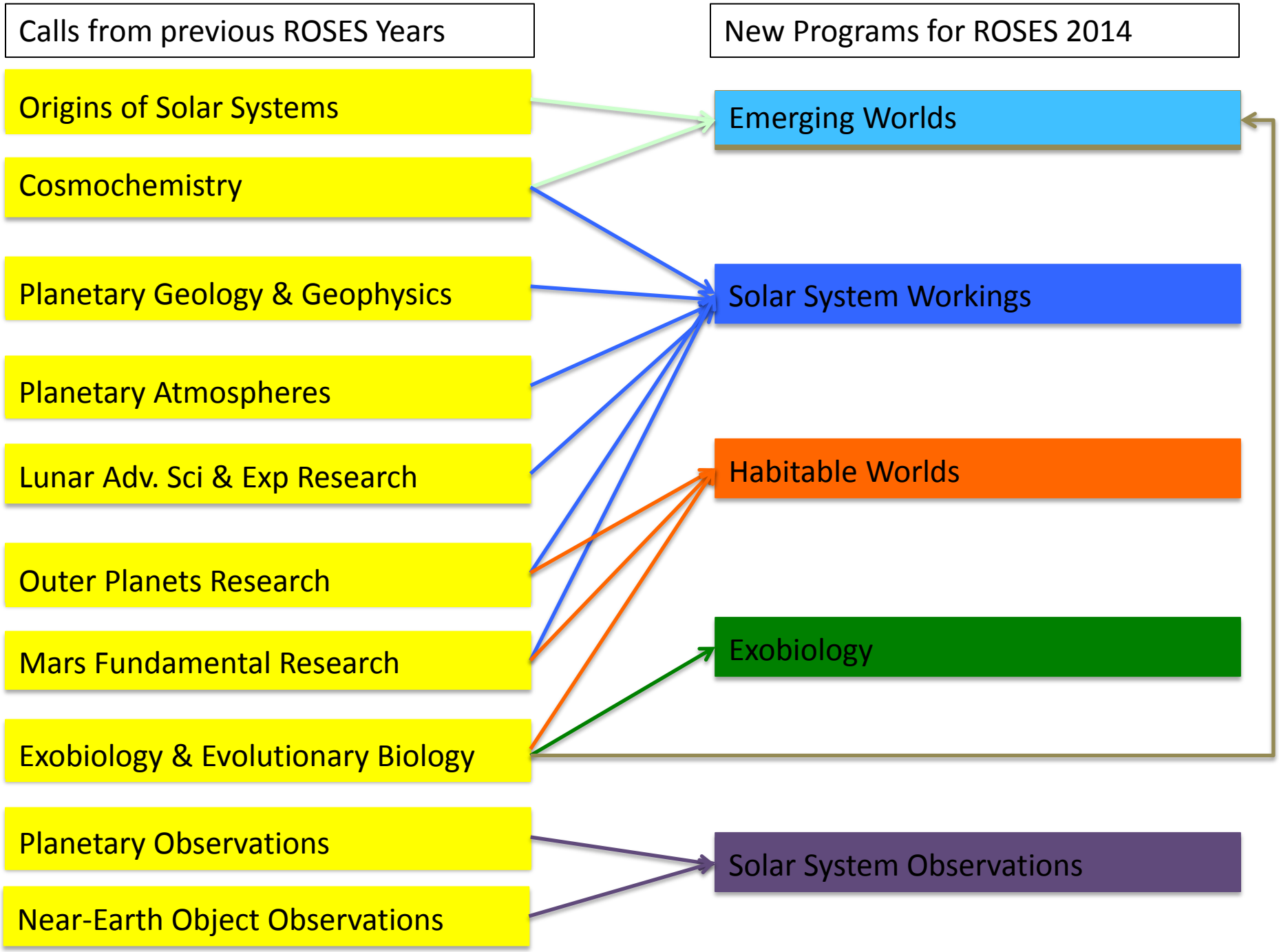
- Explore and observe the objects in the solar system to understand how they formed and evolved
- Advance the understanding of how the chemical and physical processes in our solar system operate, interact and evolve
- Explore and find locations where life could have existed or could exist today.
- Improve our understanding of the origin and evolution of life on Earth to guide our search for life elsewhere
- Identify and characterize objects in the solar system that pose threats to Earth, or offer resources for human exploration

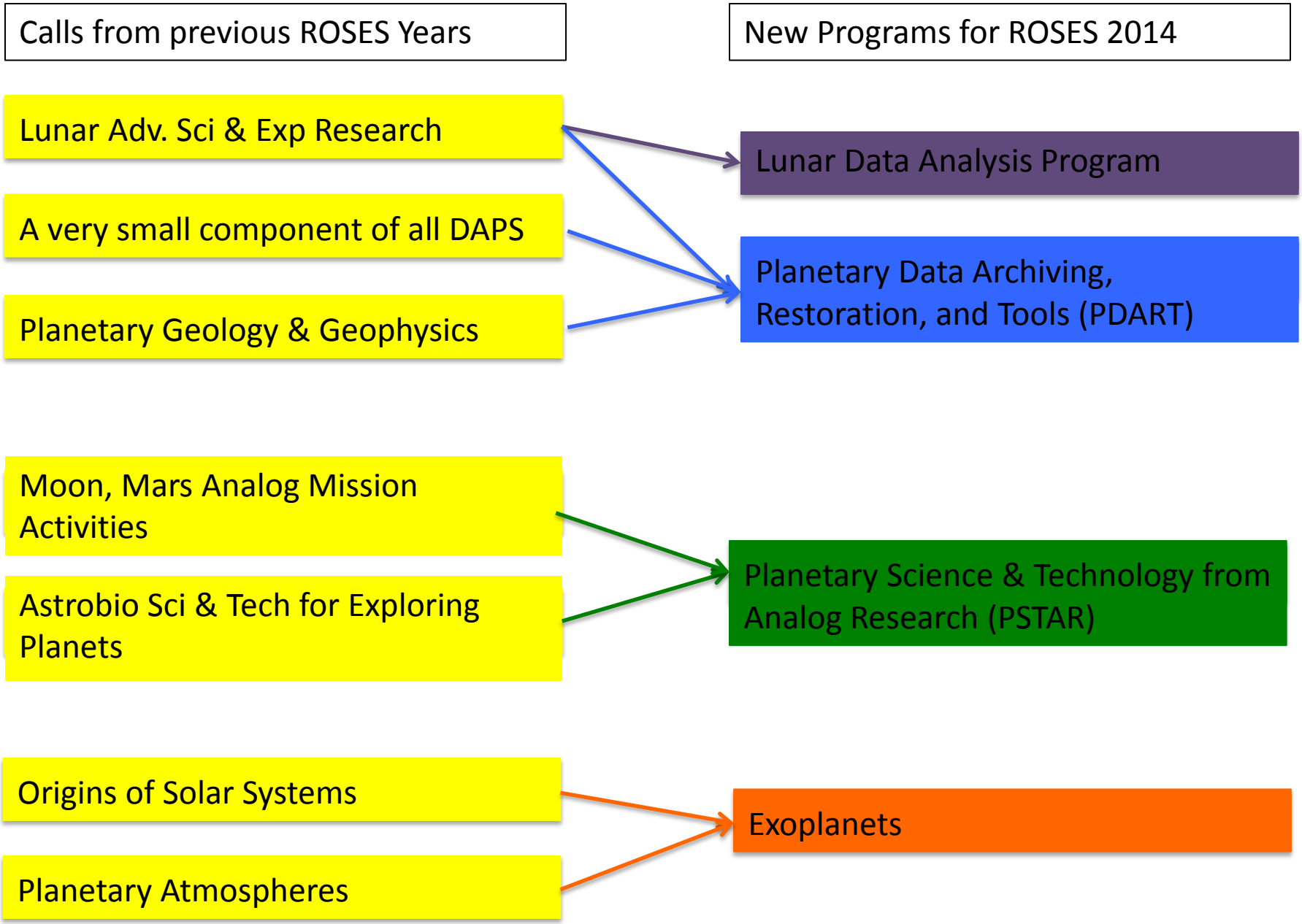
http://science.nasa.gov/media/medialibrary/2014/05/02/2014_Science_Plan-0501_tagged.pdf

New Core Research Programs Defined

The five new core programs are aligned with PSD's goals/objectives.

How did the Sun's family of planets, satellites, and minor bodies form and evolve?	**Emerging Worlds**
How do the chemical and physical processes active in our solar system operate, interact and evolve?	**Solar System Workings**
What are the characteristics of the solar system that lead to habitable environments?	**Habitable Worlds**
How did life originate and evolve here on Earth and can that guide our search for life elsewhere?	**Exobiology**
What are characteristics of planetary objects and environments that pose threats to, or offer potential resources for, humans as we expand our presence into the solar system?	**Solar System Observations**

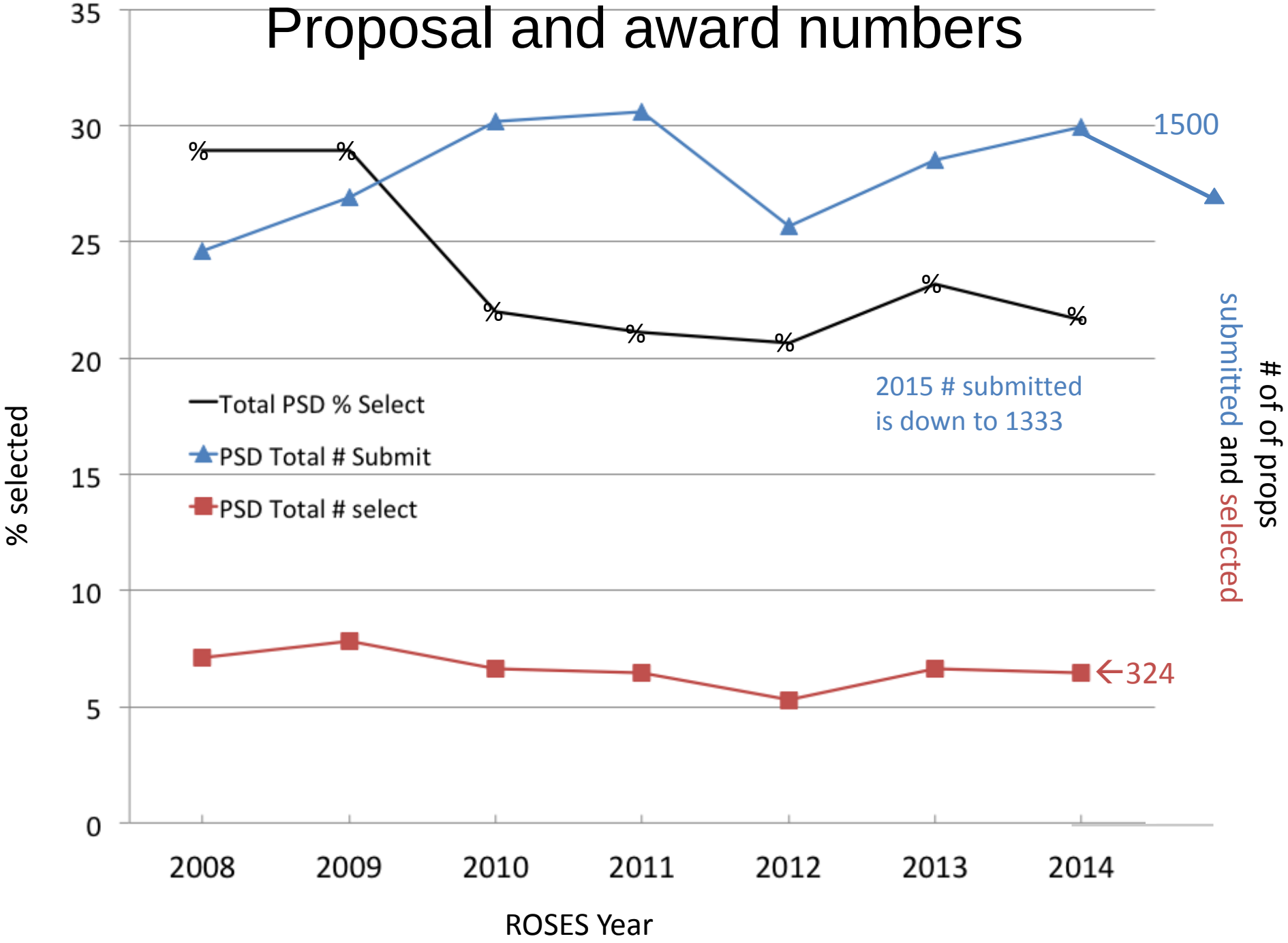

Calls from previous ROSES Years
New Programs for ROSES 2014
Origins of Solar Systems
Cosmochemistry
Planetary Geology & Geophysics
Planetary Atmospheres
Lunar Adv. Sci & Exp Research
Outer Planets Research
Mars Fundamental Research
Exobiology & Evolutionary Biology
Planetary Observations
Near-Earth Object Observations
Emerging Worlds
Solar System Workings
Habitable Worlds
Exobiology
Solar System Observations


Calls from previous ROSES Years
New Programs for ROSES 2014
Lunar Adv. Sci & Exp Research
A very small component of all DAPS
Planetary Geology & Geophysics
Lunar Data Analysis Program
Planetary Data Archiving, Restoration, and Tools (PDART)
Moon, Mars Analog Mission Activities
Astrobio Sci & Tech for Exploring Planets
Planetary Science & Technology from Analog Research (PSTAR)
Origins of Solar Systems
Planetary Atmospheres
Exoplanets

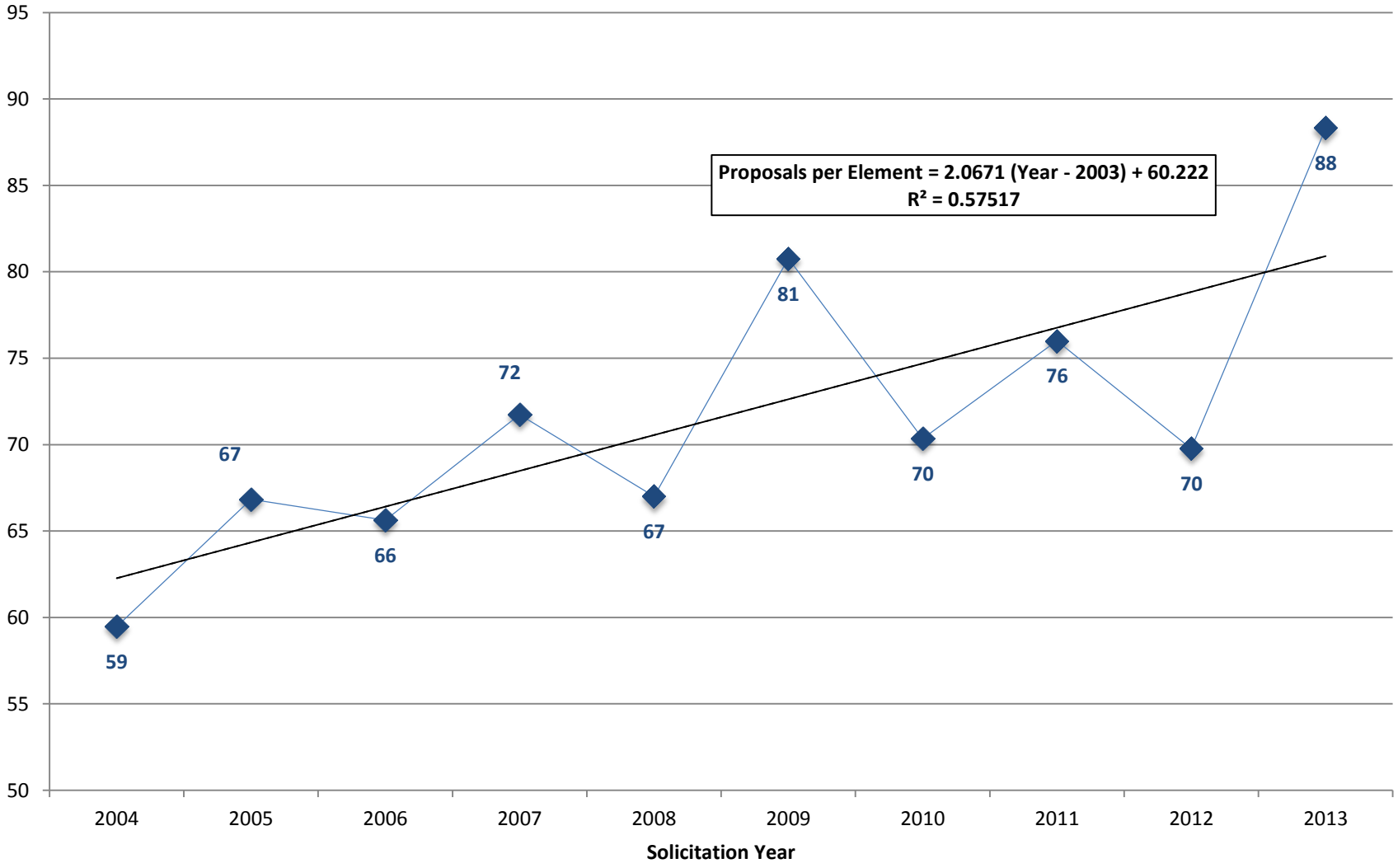
FY16 Research Budget by Funding Line

Program	Budget ($M)
Planetary R&A (Competed and supported activities)	154.0
Mars R&A (Mars Data Analysis Program) (excluding Critical Data Products (CDP)	9.4
Outer Planets Research (Cassini Data Analysis Program & PSP)	8.4
Discovery Research	11.4
Joint Robotics Program for Exploration (JRPE) (SSERVI Nodes)	10.0
NEOO (Competed activities)	20.9
Europa Technology	25.0
Total	**239.1**

Proposal and award numbers



Remove variation due to number of solicitations

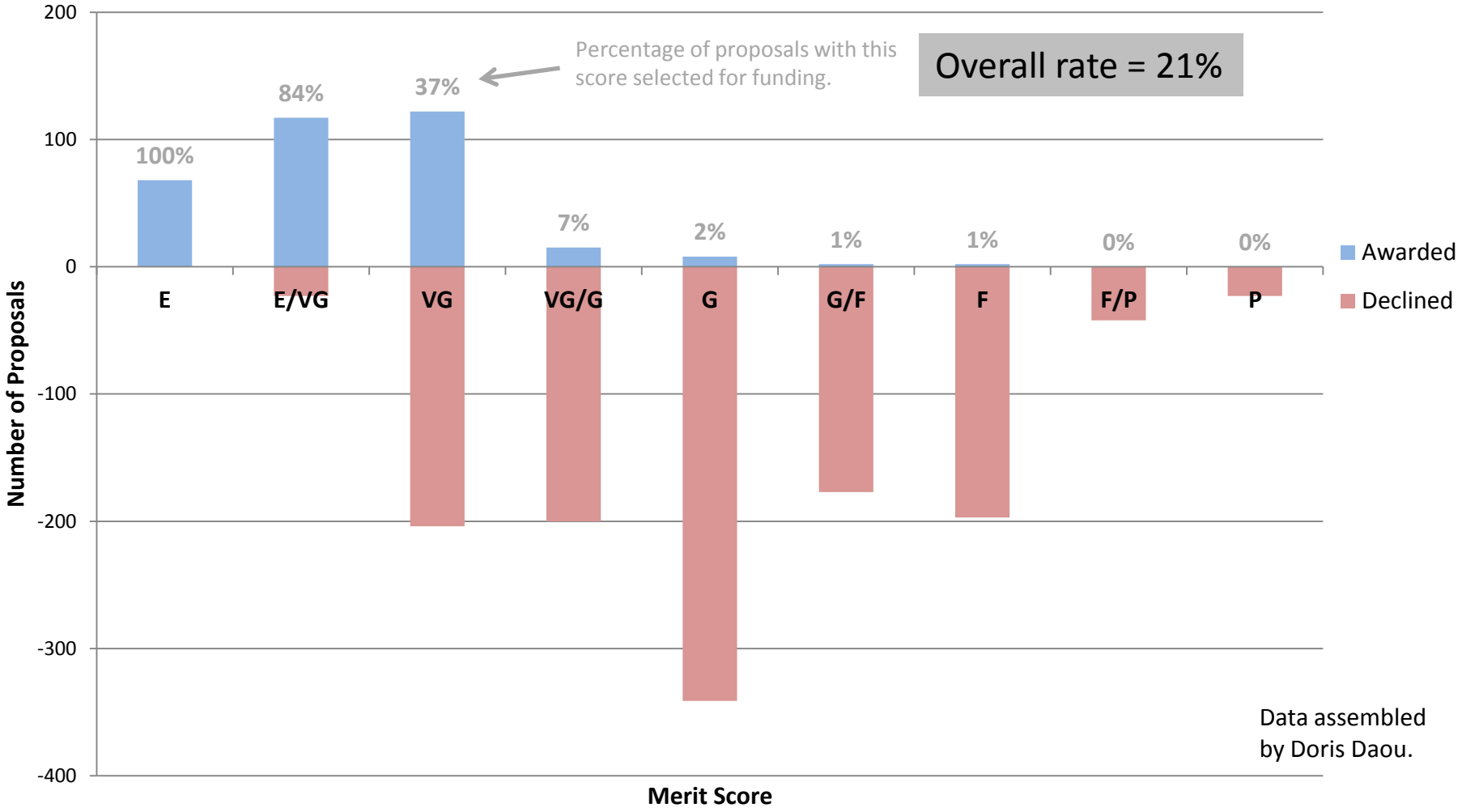


Change in Proposal Numbers

Program	ROSES 2014 Step-2 Submissions	ROSES 2015 Step-2 Submissions	% Change
EW	158	137	-13
SSW	384	315	-18
EXOB	144	179	+24
SSO	71	51*	-28
PDART	100	97	-3
CDAPS	78	84	+8
DDAP	27	39	+44
LARS	24	18	-25
XRP	134	112	-16
MDAP	104	100	-4
LDAP	51	47	-8
PSTAR	46	48	+4
HW	72	63	-13
MatISSE	44	Not solicited	
PICASSO	96	113	+18
Total	1533	1403	-15

*NEOO / MatISSE proposals not solicited in 2015

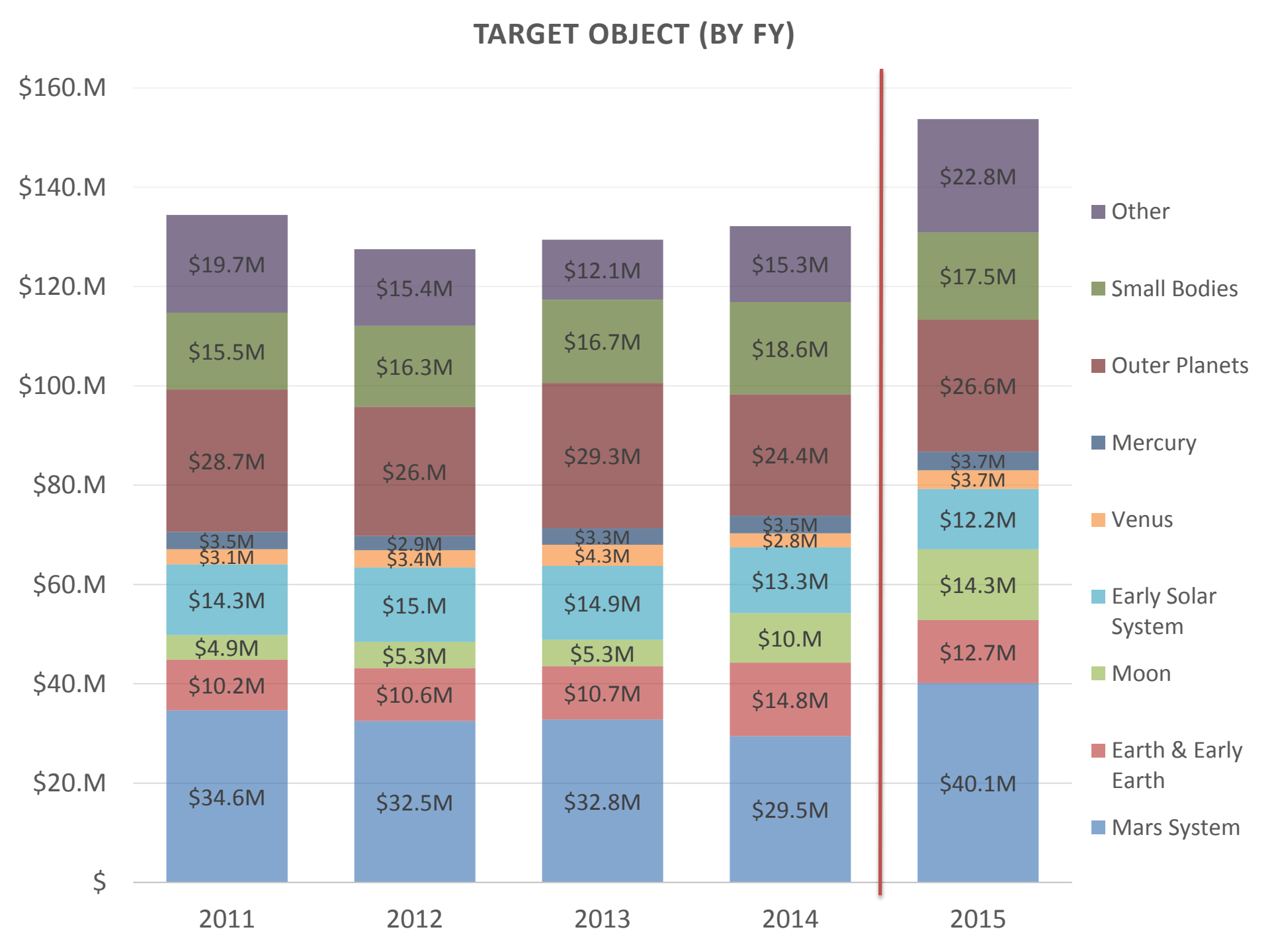
A Selection Metric

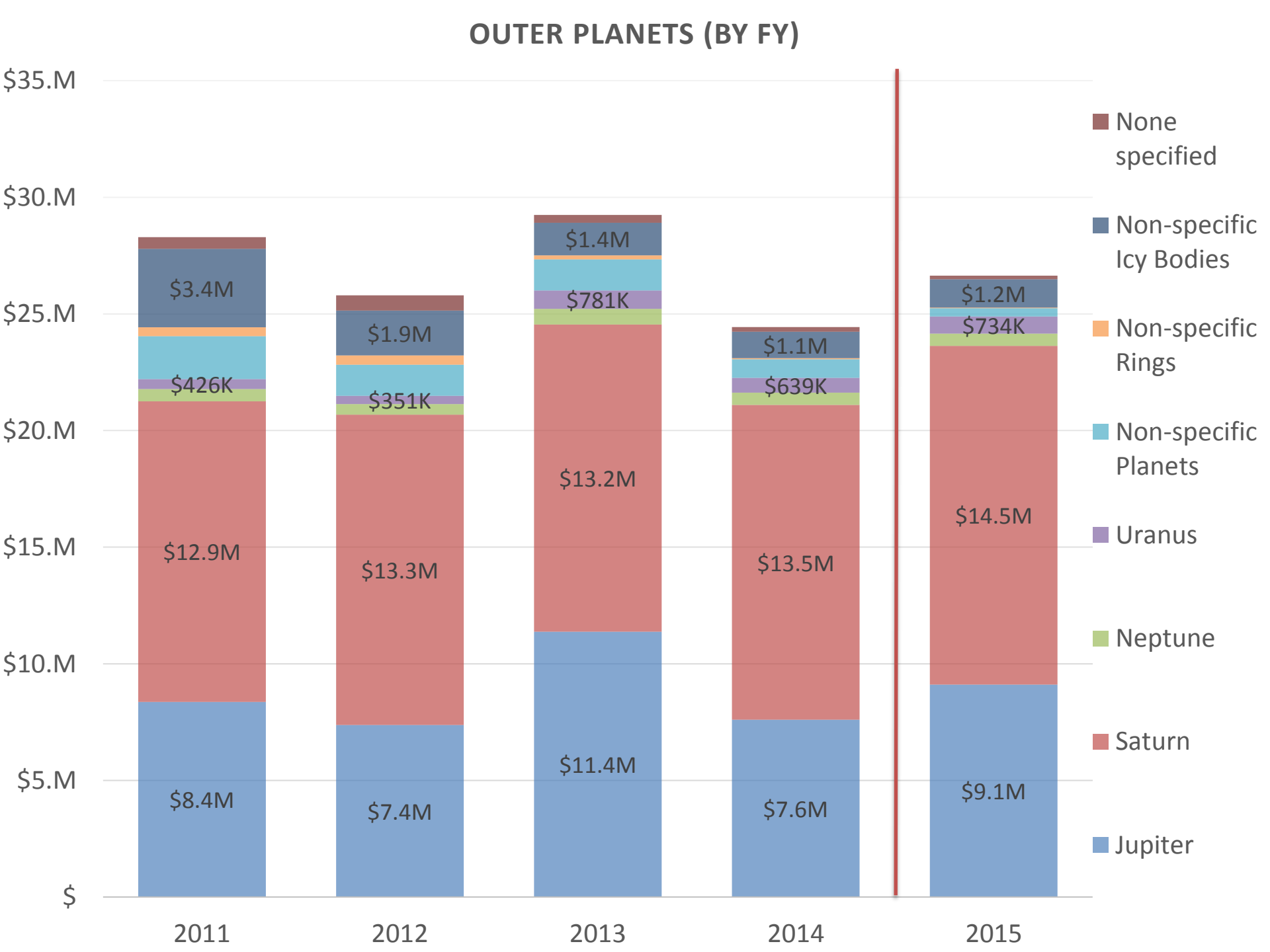


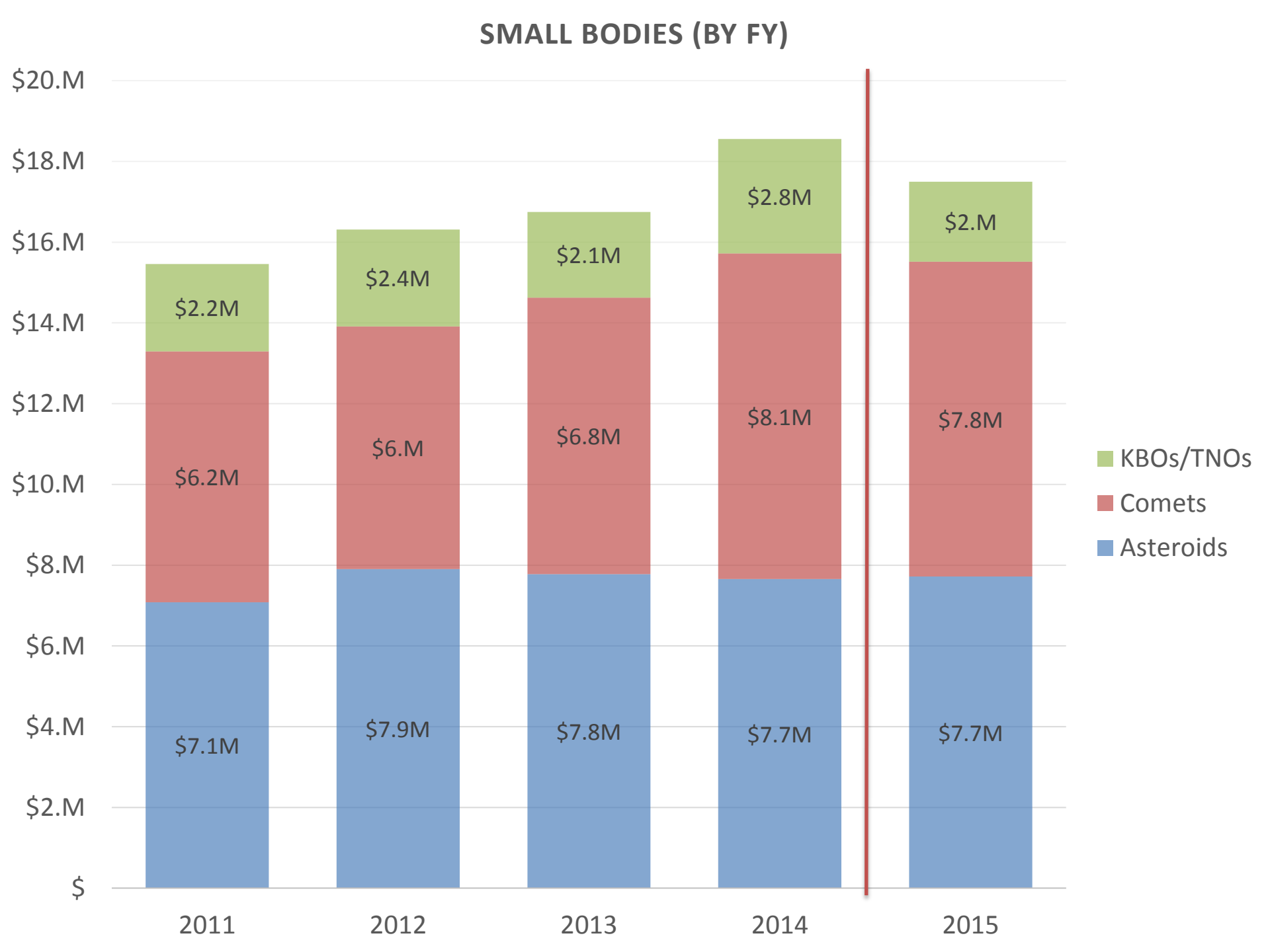
Shown are proposals submitted to ROSES-2014, including all core programs (EW, SSW, HW, SSO, EXO) and all DAPs (MDAP, DDAP, LDAP, CDAPS).

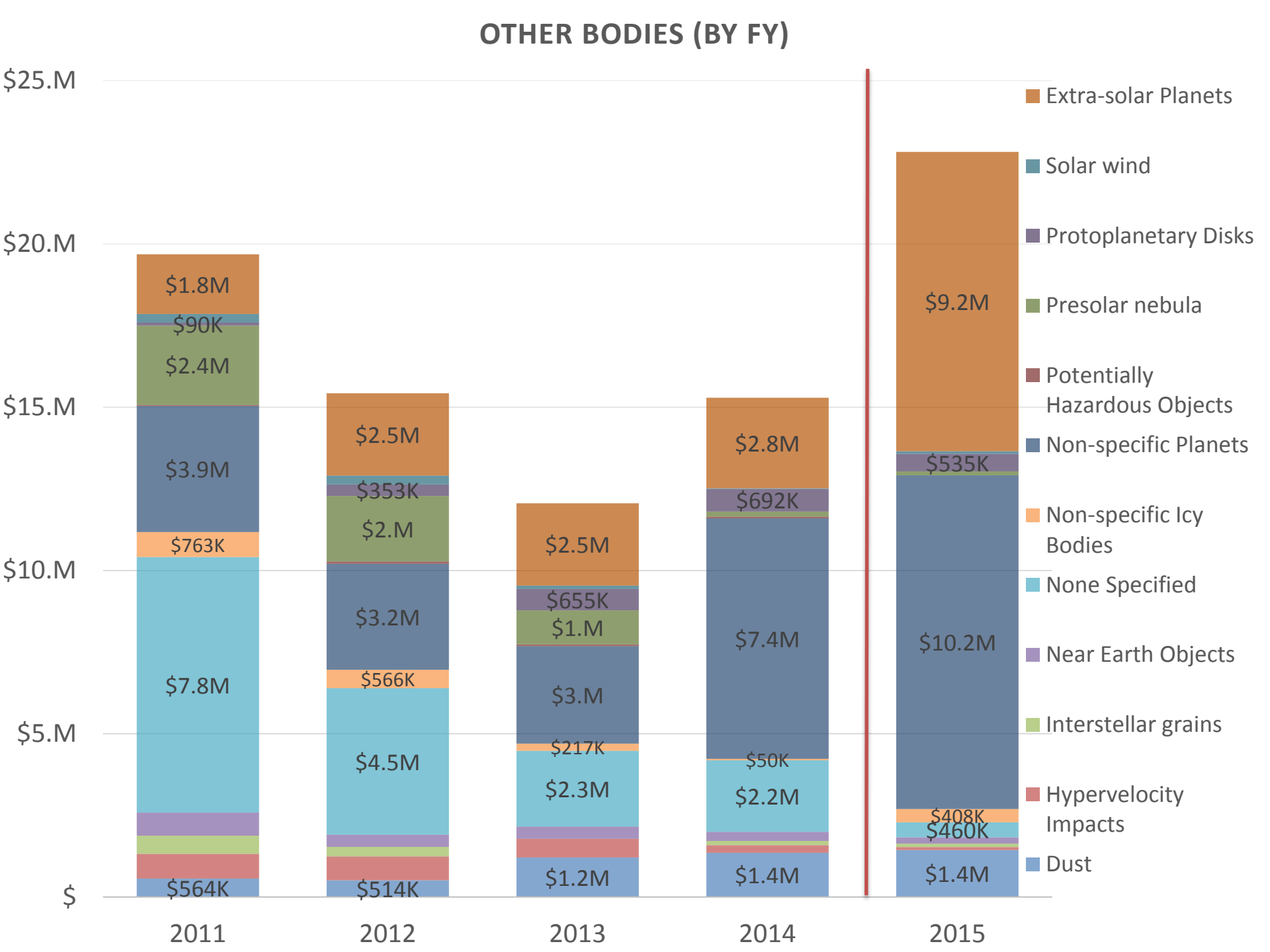
Keyword Analysis

- Analysis of “Target Object” Keyword for 2011-2015:
  - Competed ROSES programs, including
    - Data Analysis Programs (DAPs)
    - Participating Science Programs
- Excludes:
  - NASA Astrobiology Institute (NAI)
  - Solar System Exploration Research Virtual Institute (SSERVI)
- Caveats:
  - Keywords were not submitted for all tasks


TARGET OBJECT (BY FY)
$160.M
$140.M
$120.M
$100.M
$80.M
$60.M
$40.M
$20.M
$
2011
2012
2013
2014
2015
$19.7M
$15.5M
$28.7M
$3.5M
$3.1M
$14.3M
$4.9M
$10.2M
$34.6M
$15.4M
$16.3M
$26.M
$2.9M
$3.4M
$15.M
$5.3M
$10.6M
$32.5M
$12.1M
$16.7M
$29.3M
$3.3M
$4.3M
$14.9M
$5.3M
$10.7M
$32.8M
$15.3M
$18.6M
$24.4M
$3.5M
$2.8M
$13.3M
$10.M
$14.8M
$29.5M
$22.8M
$17.5M
$26.6M
$3.7M
$3.7M
$12.2M
$14.3M
$12.7M
$40.1M
Other
Small Bodies
Outer Planets
Mercury
Venus
Early Solar System
Moon
Earth & Early Earth
Mars System


OUTER PLANETS (BY FY)
$35.M
$30.M
$25.M
$20.M
$15.M
$10.M
$5.M
$
2011
2012
2013
2014
2015
$3.4M
$426K
$12.9M
$8.4M
$1.9M
$351K
$13.3M
$7.4M
$1.4M
$781K
$13.2M
$11.4M
$1.1M
$639K
$13.5M
$7.6M
$1.2M
$734K
$14.5M
$9.1M
None specified
Non-specific Icy Bodies
Non-specific Rings
Non-specific Planets
Uranus
Neptune
Saturn
Jupiter


SMALL BODIES (BY FY)
$20.M
$18.M
$16.M
$14.M
$12.M
$10.M
$8.M
$6.M
$4.M
$2.M
$
2011
2012
2013
2014
2015
$2.2M
$6.2M
$7.1M
$2.4M
$6.M
$7.9M
$2.1M
$6.8M
$7.8M
$2.8M
$8.1M
$7.7M
$2.M
$7.8M
$7.7M
KBOs/TNOs
Comets
Asteroids


OTHER BODIES (BY FY)
$25.M
$20.M
$15.M
$10.M
$5.M
$
2011
2012
2013
2014
2015
$1.8M
$90K
$2.4M
$3.9M
$763K
$7.8M
$564K
$2.5M
$353K
$2.M
$3.2M
$566K
$4.5M
$514K
$2.5M
$655K
$1.M
$3.M
$217K
$2.3M
$1.2M
$2.8M
$692K
$7.4M
$50K
$2.2M
$1.4M
$9.2M
$535K
$10.2M
$408K
$460K
$1.4M
Extra-solar Planets
Solar wind
Protoplanetary Disks
Presolar nebula
Potentially Hazardous Objects
Non-specific Planets
Non-specific Icy Bodies
None Specified
Near Earth Objects
Interstellar grains
Hypervelocity Impacts
Dust

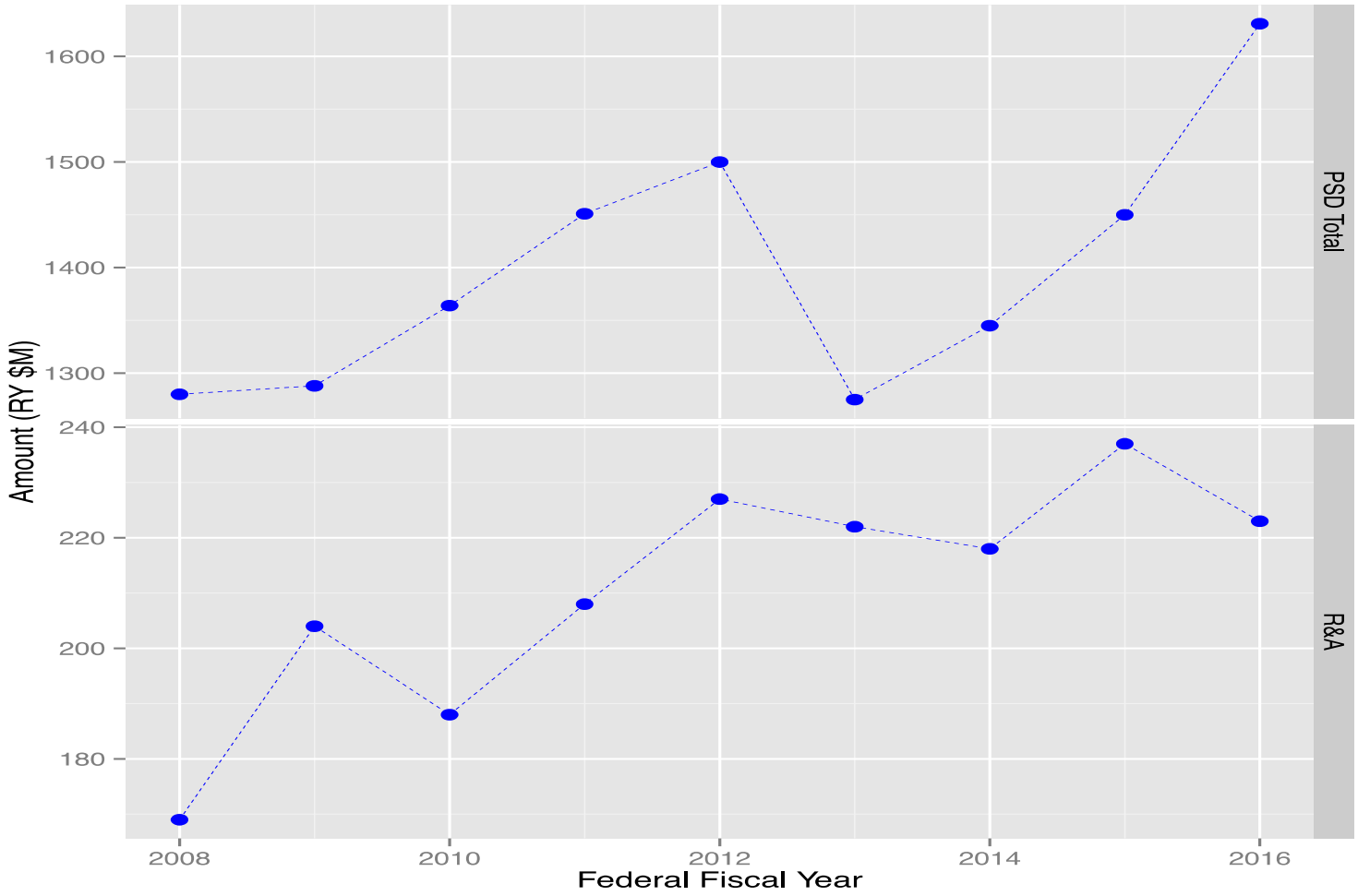
Concluding observations

- Competed research has been prioritized over non-competed activities
- Steady-state workload on program officers has increased but modulated to avoid peaks
- Staff has been added: detailees, contractors, and IPAs but Planetary R&A is still understaffed
- NASA-funded facilities review is complete, formulating ideas for solicitation for new and continuing facilities; RPIFs are currently under review
- The core structure now reflects the strategic objectives of the 2014 NASA SMD Science Plan and the Decadal Survey cross-cutting themes
- The compilation of planetary science accomplishments into the annual GPRA-MA report has been greatly simplified which also feeds into the Agency annual Strategic Objectives Annual Review (SOAR)
- For 2014 & 2015, the Agency has recognized the Planetary Science Division for having made “Noteworthy Progress” against our strategic goals, very exclusive as only two organizations within the Agency have achieved this status

QUESTIONS?

BACKUPS

PSD Budget-thru-time



Proposal Pressure (ROSS 2004 – ROSES 2013)