Understanding Planetary R&A

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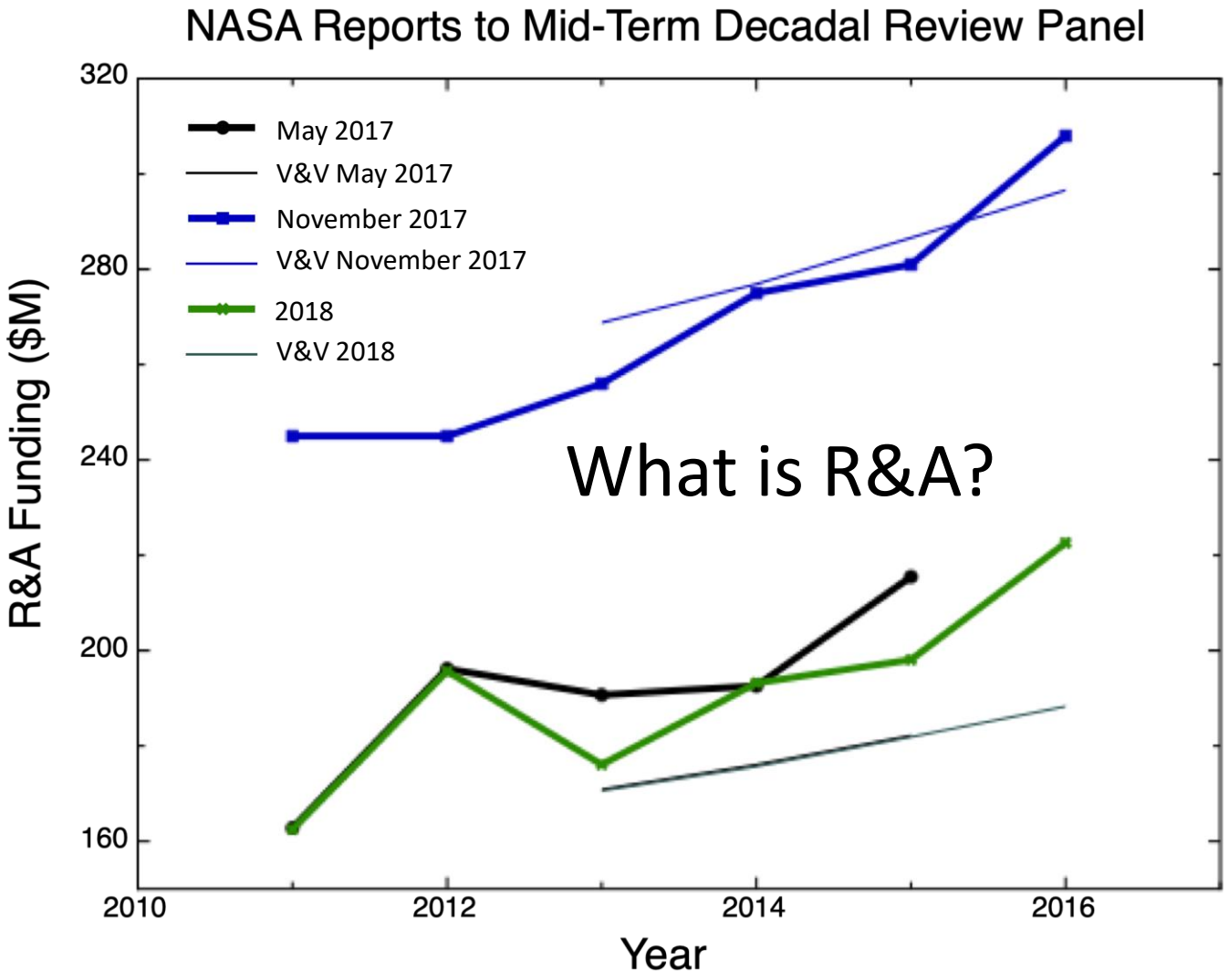
Ocean Worlds and Dwarf Planets Panel
Planetary Science and Astrobiology Decadal Survey 2023-2032

During the NRC Midterm Assessment on the last Planetary Decadal Survey (V&V), NASA was challenged a couple of times on the extent to which it complied with the recommendation on Research and Analysis (R&A) funding. In response, NASA ended up submitting three very different funding profiles.



This was possible because past Decadal Surveys have never defined what comprised "R&A" programs. It was just assumed everyone knew!

The current Decadal Survey needs to explicitly define what is and is not included when it refers to "R&A".

NOTE: V&V recommended FY13=1.05FY11, then 1.5% above inflation each year thereafter (thin lines).

Proposal:

Research and Analysis programs fund openly competed proposals for basic research and mission data analysis.

R&A does not include:

Mission development and support [this should be funded by mission programs, e.g., SmallSats]
Instrumentation/technology development [for which the Decadal Survey (V&V) made a separate rec of 6% PSD budget]
Research internally funded by the agency [which by definition is not openly competed, e.g., ISFM]

			2017	2018	2019	2020*
						209,780,000
811073	* Planetary Science Research and Analysis (SSE R&A)		178,100,000	197,900,000	195,683,000	209,542,936
811073.01.01		PSD Travel	511,646	541,336	460,424	350,000
811073.01.02		StratComm	4,825,037	3,469,357	4,014,358	3,748,633
		Education, Outreach, Stratcom, cross-division cofunding, etc.				
		US Invest Prog/Strat Com/Division Reserve				
811073.01.03		Program Managment	3,427,761	4,460,902	2,105,287	2,089,891
811073.01.04		Detailees	1,701,239	1,124,461	762,373	323,655
811073.01.05		Admin Support	706,904	663,288	704,571	1,285,000
811073.01.06		INSPIRE Cubesat	0	0	0	0
811073.01.07		International Support	0	0	0	0
811073.01.08		Venus Activities	478,000	374,868	300,000	0
811073.01.09		Planetary Decadal Support	0	0	0	12,012,542
811073.01.10		NRESS Contract	0	0	293,148	1,512,817
811073.02.01		Planetary Geology/Geophysics	2,059,673	792,547	840,500	587,818
811073.02.02		Cosmochemistry	1,226,576	362,275	0	0
811073.02.03		Planetary Astronomy	5,800,270	4,905,527	4,970,001	4,500,000
811073.02.04		Planetary Atmospheres	846,075	0	0	0
811073.02.05		Planetary Major Equipment	1,296,254	3,287,167	569,826	842,345
811073.02.06		Planetary Instrument Definition & Development	0	0	0	0
811073.02.07		Origins of Solar Systems-planetary	236,490	0	0	5,692
811073.02.08		NeoWISE/NEO	0	0	0	0
811073.02.09		Planetary Protection	2,442,723	2,523,633	3,379,321	2,937,000
811073.02.10		Astrobiology S&T-Exploring the Planets	7,338,021	5,478,962	2,892,397	3,948,915
811073.02.11		Astrobiology S&T-Instrument Dev	79,270	0	0	0

SAMPLE

When applied to the PSD budget, R&A programs (yellow in tables) are scattered among mission lines (e.g., Discovery Data Analysis under Discovery, and Mars Data Analysis under Mars Exploration), Planetary Defense (e.g., some portion of Near Earth Object Observations), and of course Planetary Science Research. At the same time under Planetary Science Research and its 811073 Planetary Science Research and Analysis line, there are programs that are clearly not R&A (e.g., PSD Travel, NRESS Contract, and Planetary Decadal Support!).

				2017	2018	2019	2020*
	New Frontiers			134,000,000	88,100,000	93,000,000	136,800,000
		* Dragonfly				8,000,000	41,000,000
		* Origins Spectral Interpretation Resource [OSIRIS-REx]		39,500,000	42,800,000	50,300,000	37,100,000
							5,880,000
135353		* New Frontiers Research		1,626,000	2,123,000	7,900,000	5,770,000
135353.02.01			Jupiter Data Analysis Program	0	0	2,287	0
135353.02.02			New Frontiers Participating Scientists	0	0	0	0
135353.02.03			New Frontiers Data Analysis Program	91,897	1,873,103	5,751,800	2,592,000
135353.02.04			Laboratory Analysis of Returned Samples - NF	664,000	0	0	1,500,000
135353.02.05			OSIRIS REx PSP	870,103	249,897	1,148,199	978,000
135353.02.06			Juno PSP	0	0	997,714	700,000
		* New Frontiers Future Missions		1,500,000	13,400,000	2,300,000	1,700,000
		* New Horizons		29,400,000	12,000,000	12,700,000	17,300,000
		* Juno		69,100,000	17,800,000	11,800,000	33,800,000

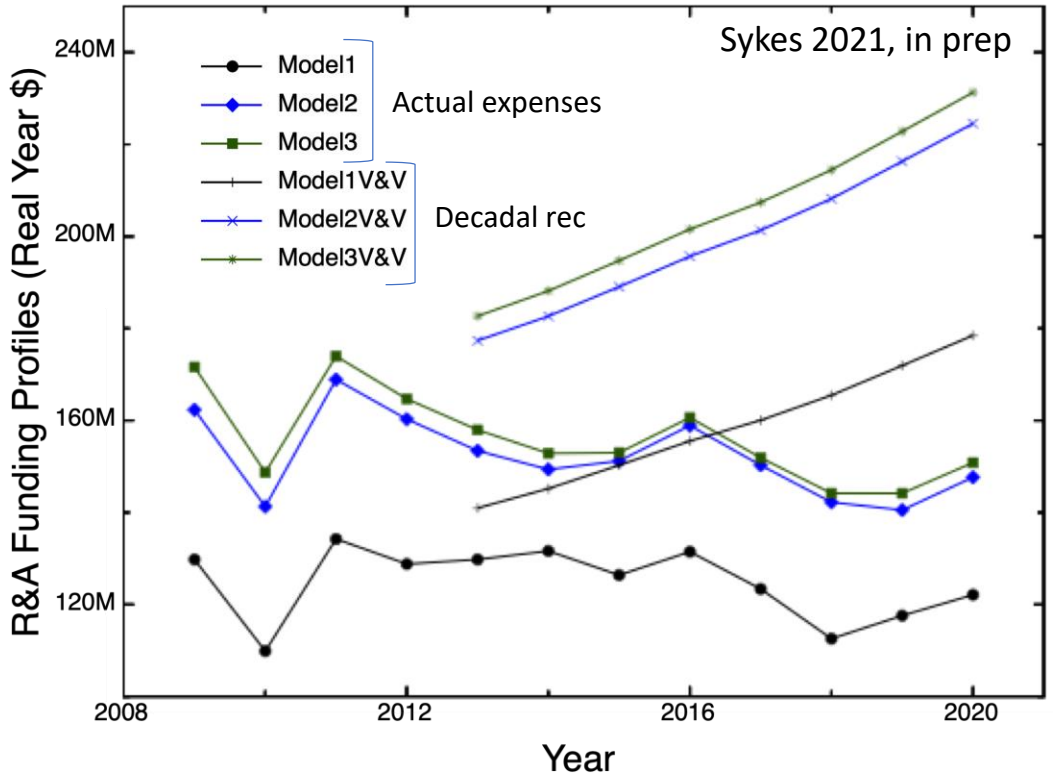
SAMPLE

The Decadal Survey needs to apply the definition of R&A to every line in the PSD budget and include in its recommendation a list of all active programs that satisfy the definition as of FY2020 to provide NASA with adequate guidance on how to implement any recommendations regarding R&A programs.

There are interesting questions the Decadal Survey needs to address: do existing Participating Scientist Programs function primarily as mission support or independent data analysis? To what extent do NAI and SSERVI fund research or act as a conduit of Center support?

NASA NEEDS TO BE TRANSPARENT

The Decadal Survey should recommend that NASA PSD publish its budget after every fiscal year at a level of detail no less than what I am providing to the Survey. Annual FOIAs should not be necessary, but will be pursued. Budgets should include further granularity for some programs (e.g., research and tech tasks for PSTAR, research and facility tasks for NEOO). NASA should also publish an assessment every year of its compliance with any Decadal Survey funding recommendations regarding R&A. In combination with detailed budget information, this will allow for open review by the planetary community and build much needed confidence in the agency.



NASA's compliance with the R&A recommendation by the last Decadal Survey (V&V) is POOR (~2/3 rec funding level).

Proposed

R&A Model 1 – excludes PSPs/GIPs, NAI, NLSI/SSERVI

R&A Model 2 – excludes PSPs/GIPs, includes NAI, NLSI/SSERVI

R&A Model 3 – includes PSPs/GIPs, NAI, NLSI/SSERVI

NOTE: When R&A budgets shrink, the reduction comes primarily out of funds for new awards with about three times the impact.

SUMMARY

1) The Decadal Survey needs to explicitly define R&A and identify those programs that meet and do not meet its criteria.
2) NASA PSD needs to be transparent, annually reporting detailed budget information for independent public assessment of compliance with decadal funding recommendations for R&A.
3) NASA did not meet the R&A funding recommendation from the last Decadal Survey (V&V).