

Earth Science Research Program: Current Status and Evolution

Presented to SMD Front Office

Outline of Presentation

- Solicitation Strategy
- Recent Statistics
- Budget Evolution
- R&A Issues

ESD Research Solicitation History

Area	Sub-Area	ROSES 05	ROSES 06	ROSES 07	ROSES 08
Research	Atmospheric Composition	Atmospheric Composition (Satellite Data Analysis, Kinetics)	Atmospheric Composition: TC-4 (FC); Ground-Networks; Modeling and Analysis	Atmospheric Composition: Aura Science Team; Glory Science Advisory Group; ARCTAS (FC)	Atmospheric Composition: Laboratory Research; Surface, Balloon, and Airborne Observations
	Climate Variability and Change	ICESat/Cryosat; OVWST	International Polar Year	Physical Oceanography, OSTST; Cryospheric Science	Modeling, Analysis, and Prediction; Physical Oceanography; Ocean Salinity Science Team (new)
	Carbon Cycle and Ecosystems	LBA (FC); NACP; Ocean Biology and Biogeochemistry; Terrestrial Ecology and Biodiversity	Ocean Biology and Biogeochemistry	LCLUC, Carbon Cycle Science; Terrestrial Ecology; Ocean Biology and Biogeochemistry	Terrestrial Ecology (TBD), LCLUC, Ocean Biology and Biogeochemistry, Biodiversity (new)
	Global Water and Energy Cycle	LCLUC; Cloudsat/CALIPSO; Terrestrial Hydrology; NEWS	Precipitation Science	NEWS; Terrestrial Hydrology	NEWS/ Water Quality (new)
	Weather	NASA African Monsoon Multidisciplinary Analyses (FC)		Wind Lidar Science	Hurricane Science Research
	Earth Surface and Interior	Earth Surface and Interior	GRACE Science Team	Earth Surface and Interior; EarthScope: The InSAR and Geodetic Imaging Component (new)	Advanced Concepts in Space Geodesy (TBC)
	Interdisciplinary, Cross-Cutting	Remote Sensing Science	Interdisciplinary Research in Earth Science; Earth System Science Research using Data and Products from the Terra, Aqua, and ACRIMSAT Satellites; GNSS Remote Sensing Science Team	Airborne Instrument Technology Transition (new); Space Archaeology (new); Accelerating Operational Use of Research Data (new)	
Applied Sciences		Decision Support		Decision Support through Earth Science Research Results	Decision Support Through Earth Science Research Results; Earth Science Applications Feasibility Studie
Data Technology		ACCESS ACT, AIST	ACCESS; MEaSURES	ACCESS IIP	AIST (TBD), ACT (TBD)
E/PO		New Investigator Program	International Polar Year EPO	New Investigator Program in Earth Science	

ROSES 08 Summary

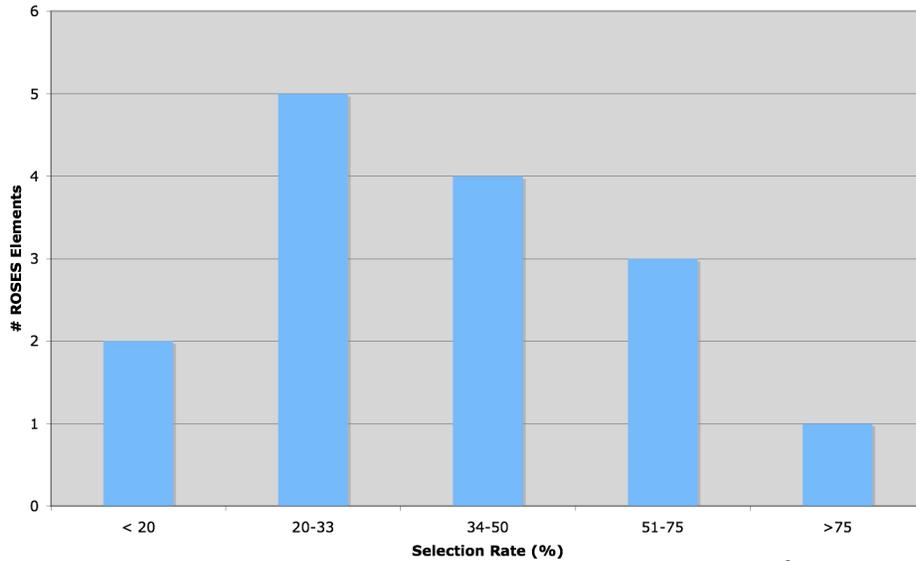
Element	Name	Due Date	Est. Am't/Yr (\$M)	Est. # Sel.	Funding period (yrs)
A.2	Terrestrial Ecology	TBD	TBD	TBD	TBD
A.4	Land Cover/Land Use Change	10/1/08	2	5 to 12	4
A.5	Biodiversity (new)	6/26/08	1.75	~7 to 10	3
A.6	Ocean Biology and Biogeochemistry	6/2/08	~2.5	~ 10 to 20	4 or shorter
A.7	Modeling, Analysis, and Prediction	5/23/08	~8	~ 30 to 40	4
A.8	Physical Oceanography	6/26/08	~1.5	~ 10	4
A.9	Ocean Salinity Science Team (new)	10/30/08	~2	~15	4
A.13	NASA Energy and Water Cycle Study - Water Quality (new)	8/19/08	~1.5	~7	4 or shorter
A.14	Atmospheric Composition: Laboratory Research	6/16/08	~ 3	~ 15 to 20	3
A.15	Atmospheric Compstion: Surface, Balloon, and Airborne Observations	7/15/08	~ 8	~ 30 to 25	4
A.16	Hurricane Science Research	5/16/08	~ 1.6	~ 10 (+ 5 @\$20K)	4
A.17	Advanced Concepts in Space Geodesy	TBD (Y/N)	TBD	TBD	TBD
A.18	Decision Support Through Earth Science Research Results	8/13/08	~6	20 to 23	up tp 4
A.19	Earth Sciene Applications Feasibility Studies	8/27/08	~1	9 to 15	1 to 1.5
A.20	Advanced information Systems Technology	8/29/08	TBD	TBD	TBD
A.21	Adanced Component Technology	TBD	TBD	TBD	TBD

Implementation Changes

- Use of Selectable Proposals
 - ESD has made targeted use of the “selectable” category:
 - FY06 Terra/Aqua recompetete - 28 of 29 eventually selected ~ 2 months after initial selection
 - FY07 ARCTAS - 3 of 5 selected (aircraft accommodation issues, not funding)
 - FY07 Terrestrial Ecology - 1 pending (awaiting resolution of management issues)
 - FY07 Wind Lidar - 2 placed in category - 1 selected, 1 awaiting revised budget
 - FY07 AITT - 2 selected
- Grant Length Evolution
 - ESD has had a history of funding some proposals for 4 and 5 years (going back pre-ROSES)
 - FY07 ROSES elements involving other than 3 year proposals
 - LCLUC - mix of 2 and 3 year proposals
 - OSTST - 4 year proposals
 - Glory Science Advisory Group - 2 year proposals
 - ARCTAS - mix of 3 and 4 year proposals
 - Accel. Oper. Use. Res. Data - 2 years
 - AITT - mix of 2 and 3 year proposals
 - NEWS and Terrestrial Hydrology - up to 4 years
 - FY 08 ROSES allows for 4 years except for the following elements
 - Biodiversity (3 years)
 - Atmospheric composition - Laboratory research (3 years)
 - Earth Science Applications Feasibility Studies (1-1.5 years)

Statistics of Recent Selections

ROSES 07 Selection Rates

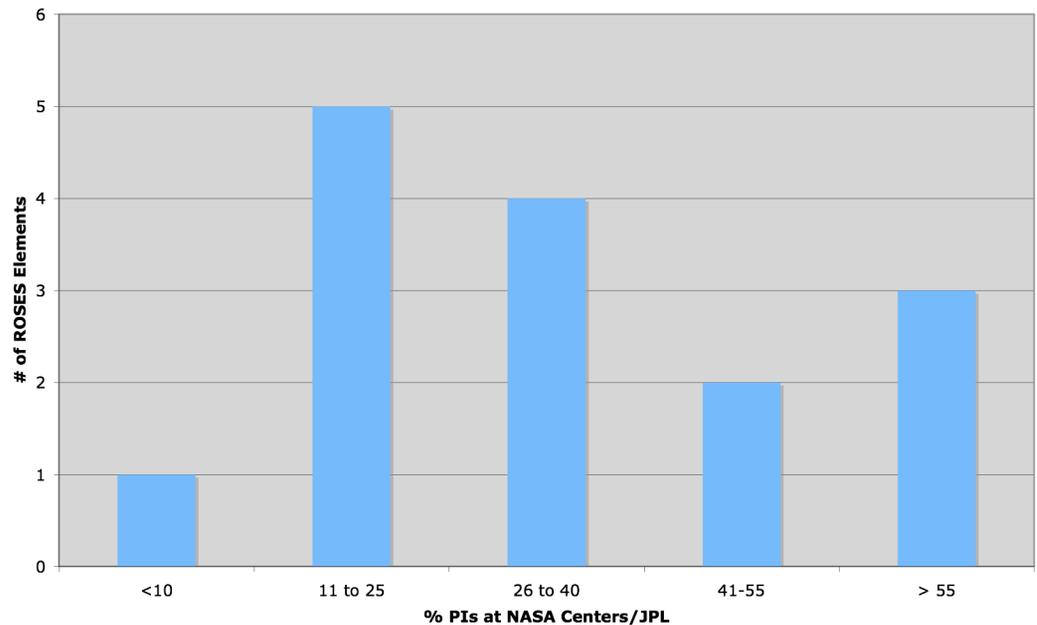


← Selection Rates (%)

NASA/JPL PI Percentages

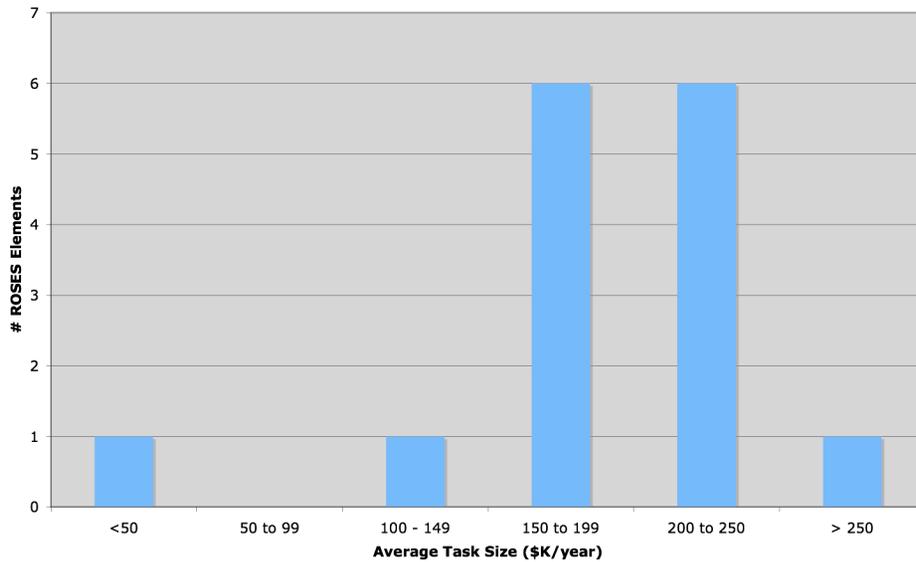


% NASA Center/JPL PIs in ROSES 07 Selection



Average Award Size Distribution

Average Task Size Distributions - ROSES 07 Selection

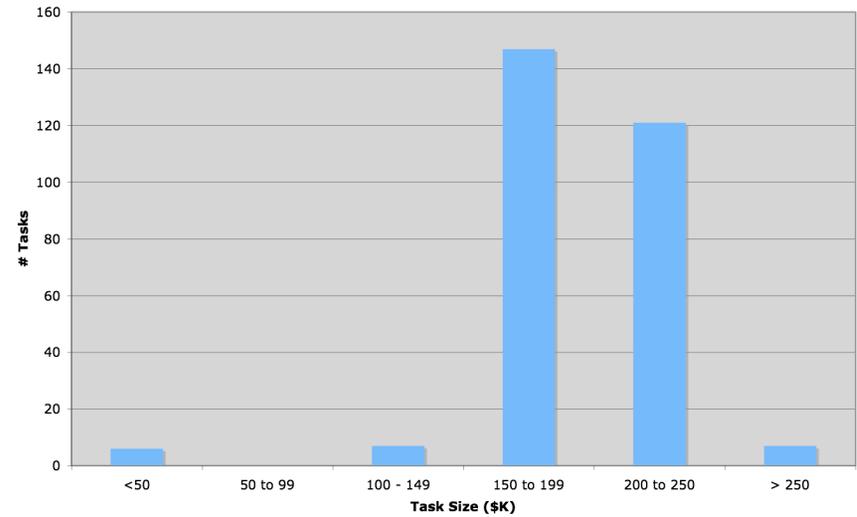


← By ROSES Element

By Number of Tasks

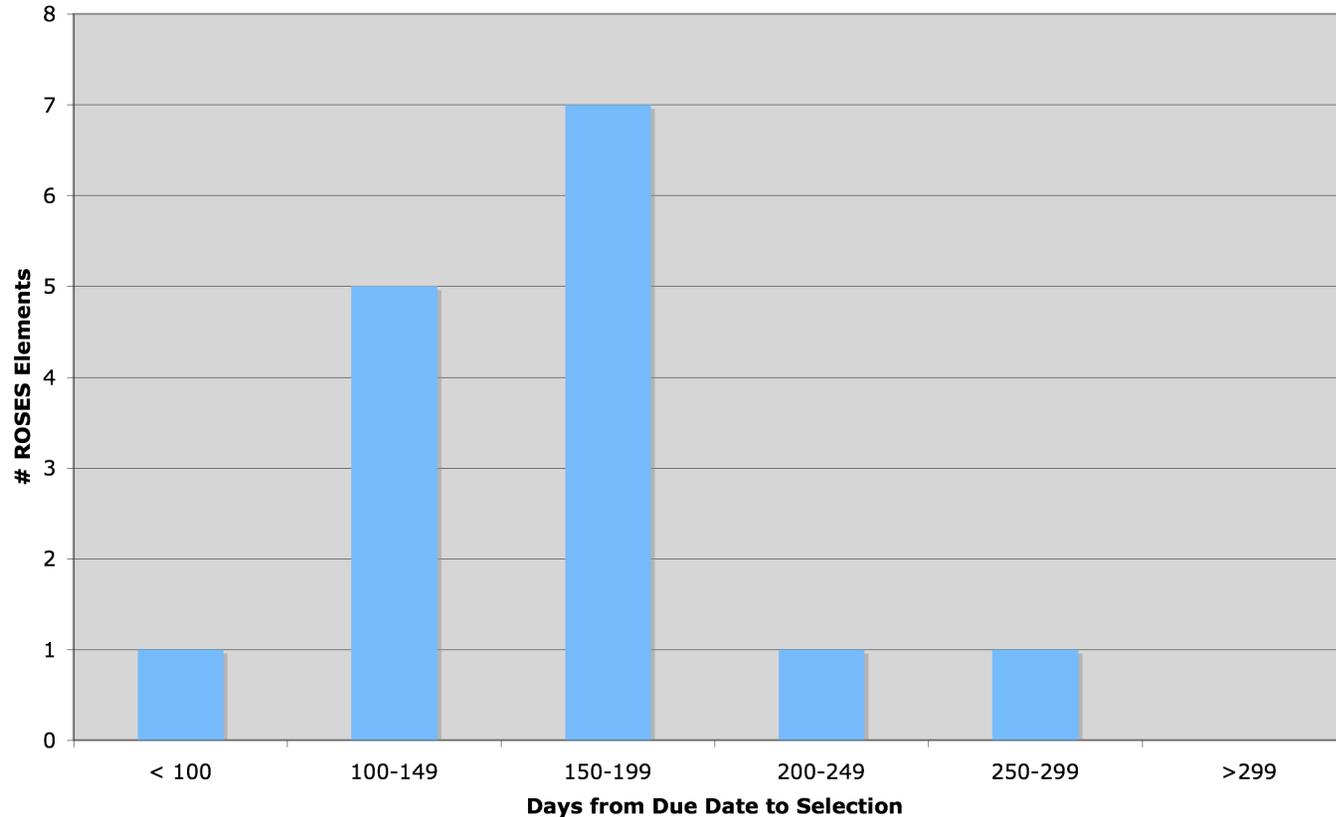


Average Distribution of Task Sizes - ROSES 07



Summary of Selection Times

Selection Times (ROSES 2007 to date)



Does not reflect remaining selections (due dates shown, with est. times until selection):

New Investigator Prog. (8/31/07, 243)

Terrestrial Hydrology (1/15/08, 167)

Earth Surface and Interior/

Ocean Biology and Biogeochemistry (2/29/08, 107)

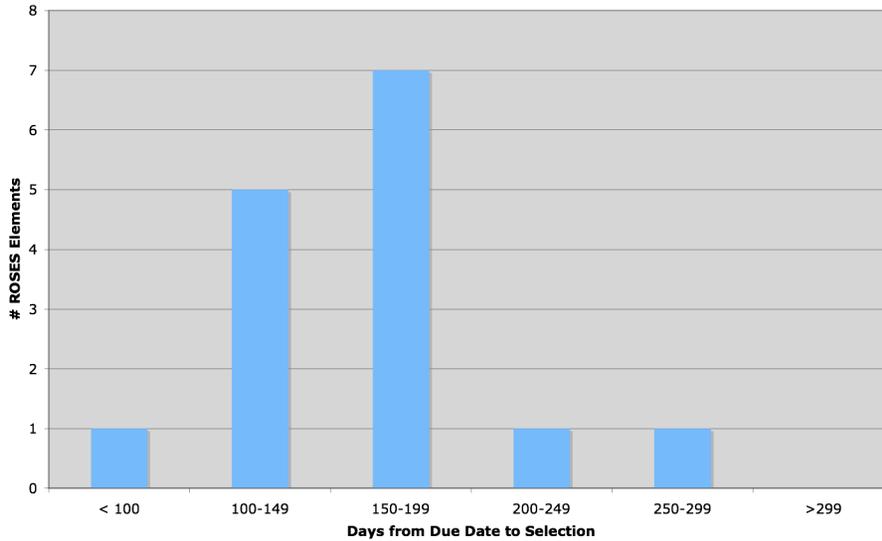
EarthScope (11/26/07, 189)

NASA Energy & Water Cycle Study (3/12/08, 156)

Inst. Incubator Prog. (12/12/07, 117)

Comparison of Selection Times to those Shown 9/07

Selection Times (ROSES 2007 to date)

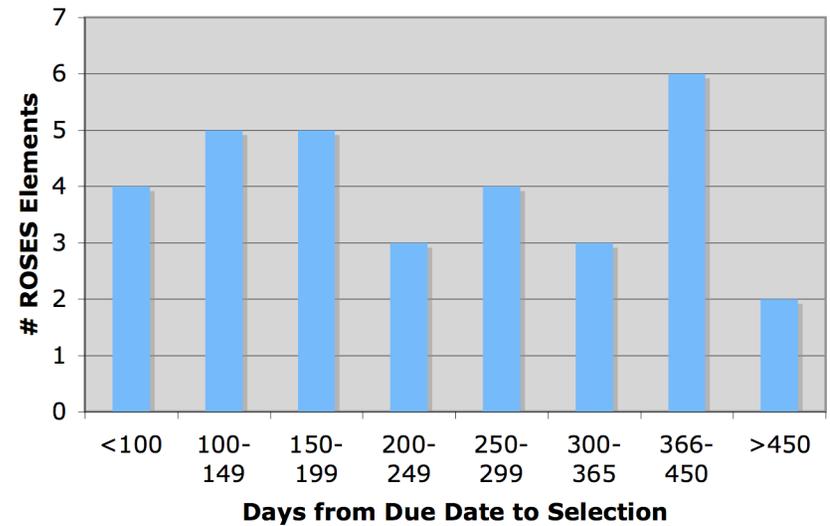


← ROSES 07 to date

ROSES 05 and 06



ROSES Selection Times (05/06)



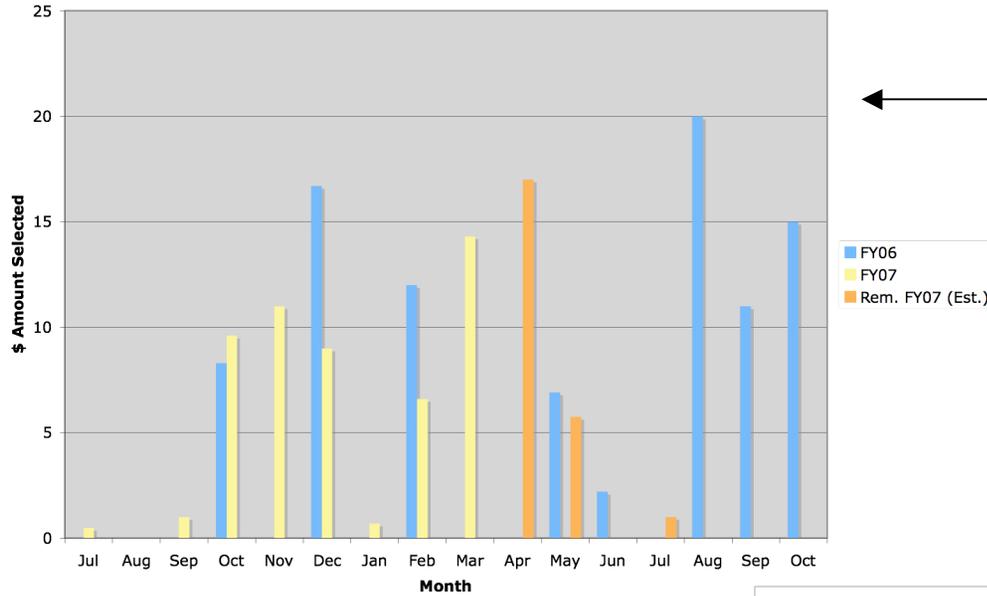
Selection Time* Summary - ROSES 06/07

	Avg Time by Element	Avg Time by # Proposals
ROSES 06	255	290
ROSES 07	162	175

* Days from Due Date to Selection, ROSES 07 so far

Selection Amounts vs. Time

\$ Amount Selected by Month

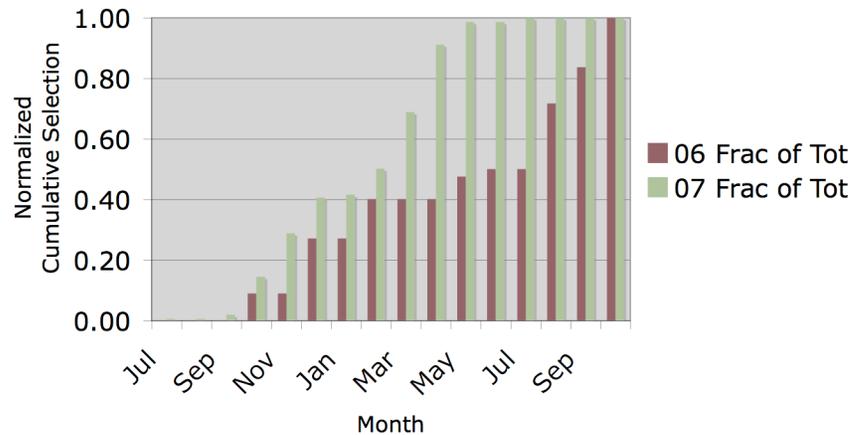


← \$ Amount Selected by Month

Normalized Cumulative Selection



Normalized Cumulative Selection \$ Amounts by Month



Earth Science Research - FY08-FY13*

(in \$M)	FY08	FY09	FY10	FY11	FY12	FY13
Research and Analysis	133.9	136.9	144.4	146.4	149.8	153.5
EOS Science	62.4	62.3	62.6	61.5	62.3	63.7
HECC	38.9	41.9	42.8	43.8	44.8	45.9
Airborne Science	31.1	26.3	25.7	24.0	26.4	27.0
Scientific Computing	20.0	18.9	18.4	18.6	19.4	19.9
Space Geodesy/SLR	11.3	14.4	14.5	14.6	15.0	15.1
Global Modeling & Assimilation Office	10.8	10.1	10.4	10.6	11.3	11.6
Near Earth Object Observations	3.4	3.7	3.8	3.8	3.9	4.0
Ozone Trends Science	2.9	3.2	3.2	3.1	2.4	2.5
Carbon Cycle Science	2.2	2.3	2.3	2.3	2.4	2.5
Mission Science Guest Investigator	0.8	0.8	0.8	0.9	1.0	1.0
Total	317.8	320.8	328.9	329.6	338.7	346.7

* From current data base - 2/11/08

R&A Evolution Strategy

- R&A Program had been on track for partial rebuilding from FY06 cuts (~\$6-7M/yr) from 08 through 10 with standard growth (~2.4%) thereafter
- Plan was to apply new \$ to targeted solicitations (vs. general increase to existing programs)
 - addressed gaps and opportunities in current program
 - took national objectives into account
- FY08 one-time enacted budget increase (~\$3.4M) allowed for augmentation of selected R&A programs to enhance field work (~1/3) and address limitations (esp. in center-heavy programs which suffered CM&O related budget reductions)

ROSES 07 New Elements

- *Airborne Instrument Technology Transition* - bridge gap between ESTO/IIP and availability of “hardened” instruments to support regular field work (\$2.6M in FY08)
 - All seven selected proposals had NASA center PIs
 - Proposals involve significant intercenter and community (industry/academia/other government agency) partnerships
- *Accelerating Operational Use of Research Data* - provide opportunities for community participation of transition science (R-to-O) that complements Joint Center for Satellite Data Assimilation and Short-Term Regional Prediction Center, and introduces focused oceanic component (~\$1.3M in FY08)
- *Space Archaeology* - provide opportunities for community participation that complements work at centers (esp. MSFC) (~\$0.7M in FY08)
- *EarthScope* - provide opportunity for NASA community to apply InSAR and geodetic imaging to interagency EarthScope initiative (~\$1.5M/yr by FY09)

ROSES 08 New and Enhanced Elements

- *Biodiversity* - first NASA solicitation focused exclusively on biodiversity studies using remote sensing data - addresses terrestrial, marine, and aquatic species (~\$1.75M)
- *NEWS/Water Quality* - develop/demonstrate feasibility of remote sensing for water quality, including algorithms to remotely sense inland and coastal water quality and provide the scientific basis for next-generation water quality remote sensing (~\$1.5M)
- *Ocean Salinity Research Team* - prepare for availability of Aquarius data (~\$2M)
- *Dynamical Ice Sheet Modeling* - enhanced, focused effort as part of Modeling, Analysis, and Prediction element (~\$1M)

FY08 R&A Field Program Highlights

- *GasEx* - Ongoing (late Feb - early April) Interagency field program aboard NOAA ship Ron Brown quantifying atmosphere-ocean gas exchange processes in poorly sampled Southern Ocean, providing unique cal/val opportunity for NASA and other satellites, as well as input into carbon cycle models
- *ARCTAS* - multi-aircraft (DC-8, P-3, B-200), multi-deployment (spring, summer) campaign studying transport of trace gases and particulate matter to Arctic and their chemical and radiative impacts (including role of Boreal fires). Supports IPY.
- *AMISA* - DC-8 flying in Arctic to study radiative issues associated with Arctic sea ice and overlying atmosphere; coordinated with Swedish ship-based measurements. Supports IPY.
- *NOVICE* - WB-57 flying this summer to provide test platform for numerous instruments (ARC, LaRC, NOAA/ESRL, Harvard) mainly in atmospheric composition focus area.

NASA Participation in Interagency Solicitations

- *ROSES 07 Carbon Cycle Element (A.3) - had USDA/CSREES Participation - they funded 3.5 of 35 tasks.*
- *National Ocean Partnership Program (NOPP) Broad Agency Announcement (BAA): Released by ONR 8/21/07. Proposals Due 12/11/07 - addresses 3 of the 4 near-term priorities identified in the *Ocean Research Priorities Plan and Implementation Strategy*. Particular interest to NASA is Topic 3 “Sensors for Measurement of Biological, Bio-Optical or Chemical Properties of the Ocean” subtopic B “Development of the next generation of biological, chemical, optical and bio-optical field sensors”*
- *ECOHAB (Ecology and Oceanography of Harmful Algal Blooms): Released by EPA 7/3/07. Proposals Due 10/4/07. NASA emphasis: “NASA is interested in developing remote sensing techniques that could be applied to the detection or tracking of HABs, as well as the physiological status or taxonomic classification of bloom organisms, in nearshore coastal environments, as well as in the open ocean. NASA is also interested in physical processes that affect harmful algal bloom dynamics.”*
- *Joint Center for Satellite Data Assimilation Federal Funding Opportunity: NASA participates in annual interagency call (NASA/NOAA/IPO). Annual NASA investment is \$500K out of combined interagency total of \$1.5M/year*

NASA Research and Researchers Supporting National and International Assessments

- NASA Researchers make significant contributions to major national and international assessments
 - Intergovernmental Panel on Climate Change (IPCC)
 - Authors (eg., C. Rosenzweig, NASA/GISS as Convening Lead Author for one chapter of IPCC WG II)
 - Reviewers
 - Model Providers
 - WMO/UNEP Ozone Assessment
 - Paul Newman (GSFC) now taking on role as a co-chair
 - Climate Change Science Program Synthesis and Assessment Products
 - S&AP 2.3 precursor papers involved numerous NASA authors
 - NASA scientists are serving as authors on multiple products (not just ones that NASA leads)

Major Issues for R&A Management

- Significant progress has been made on reducing time to selection, but need to improve consistency
 - Programs without permanent HQ civil servant managers are taking longer (e.g., Cryospheric Science, Aura)
 - Must refine approaches to facilitate rapid review and selection for large elements that will come up in future
 - Increased pressure for early obligation necessitates careful planning of due dates for ROSES elements
 - We have made some progress in moving away from later due dates
 - While earlier is typically better, not all elements can be due at around the same time
 - Having adequate process support and timely analysis becomes increasingly crucial to avoid bottlenecks and to track performance
- Near- and longer-term staffing concerns based on anticipated “goings” which need to be balanced by “comings” and concerns about overcommitment and “single point failures” in program management
- Staffing levels and pressures could limit R&A managers’ ability to support interagency activities (e.g., CCSP, OAP, GEO)

Backup Slides

ROSES 07 Summary

Due Date	Last Milestone	Date	Days from Due to Selected	# Prop Selected	% Prop. Selected	Selectable History	# NASA/JPL PI Selected	% NASA/JPL PI Selected	Task Length (yrs)	\$ Selected (\$M/yr)	Average Task Size (\$K)
10/1/07	Letters Signed	3/6/08	157	17	22	N/A	1	6	2 or 3	3	170
6/6/07	Selection	11/16/07	163	35	31	N/A	7	20	3	8	230
9/20/07	Letters to Signed	3/10/08	172	10	17	1 pending	2	20	3	2.3	230
2/29/08	Proposals Received			TBD	TBD	TBD	TBD	TBD		1.5	
6/28/07	Selection	12/3/07	168	11	29	N/A	2	18	3	2	180
11/7/07	Signed Selection	2/29/08	114	27	48	N/A	8	30	4	5	200
8/16/07	Steering Committee	3/13/08	221	19	36		4	21	3	3	150
3/12/08	Awaiting Proposals			TBD	TBD	TBD	TBD	TBD	4	1	
1/15/08	Proposals Received			TBD	TBD	TBD	TBD	TBD	4	0.75	
6/15/07	Letters Signed	3/12/08	271	39	52	N/A	16	41	3	6	150
5/1/07	Selection	7/13/07	73	12	100	N/A	3	25	2	0.5	40
6/15/07	Selection	10/29/07	136	41	56	5 initially (3 sel., 2 decl.)	12	29	3, 4	7	175
5/16/07	Selection	9/11/07	118	7	54		4	57	3	1	150
9/18/07	Selection	2/7/08	139	6	38		3	50		1.6	250
11/26/07	Proposals Received			TBD	TBD	TBD	TBD			3.5	
11/26/07	Proposals Received			TBD	TBD	TBD	TBD			1.5	
5/16/07	Selection	10/11/07	148	7	19		7	100	2 to 3	2.6	350
7/25/07	Selection	1/23/08	182	7	44		2	29		0.7	100
5/25/07	Selection	12/4/07	193	33	26		10	30	1 or 3	7	200
8/31/07	Panel Scheduled	3/28/08	TBD	TBD	TBD	TBD	TBD				
6/1/07	Selection	11/19/07	171	10	32	TBD	6	60	2	3.4	340
12/12/07	Panel Held	2/29/08		TBD						15	TBD

AITT Selections

PI	Institution	Partners	Short Title:	Short Description	Total (2-3 yr) Funding
Chris Hostetler	LaRC	1. Welch Mechanical Design, LLC.	Multiwavelength HSRL/Ozone DIAL for Operation on the ER-2	High Spectral Resolution Lidar (HSRL) for deployment on the NASA ER-2 aircraft. The HSRL technique enables independent measurement of aerosol backscatter and extinction	921960
Simon Yueh	JPL	1. University of Michigan ; 2. Ohio State University ; 3. GSFC	PALS (Passive and Active L-band Sensor) -ADD (Agile Digital Detector)	L-band RFI mitigation (on board P-3 and Twin Otter) will have a major impact on Aquarius and future SMAP missions	886600
Bjorn Lambrigt sen	JPL	1. Swales Aerospace	UAV-HAMSR	Integrate an IIP developed microwave radiometer, the High Altitude MMIC Sounding Radiometer (HAMSR), onto a NASA Unmanned Aerial Vehicle (UAV)	799300
Bruce Gentry	GSFC	1. NOAA	TWiLiTE Flight Validation	Getting IIP developed The Tropospheric Wind Lidar Technology Experiment (TWiLiTE) ready for DC-8 based Hurricane experiment	650000
David Diner	JPL	1. University of Arizona	Airborne Multiangle SpectroPolarimetric Imager	Conversion of a laboratory polarimetric camera to an ER-2 based Airborne Multiangle SpectroPolarimetric Imager for aerosol remote sensing	1004632
Michael Kavaya	LaRC	1. University of Alabama ; 2. Science Systems and Applications Inc. ; 3. Simpson Weather Associates ; 4. MSFC	Integration of a Coherent Doppler Wind Lidar Aircraft-Ready System	To have a coherent Doppler lidar system ready for DC-8 based flights that accurately measures wind profiles	1021000
Edward Browell	LaRC	1. University of New Hampshire ; 2. JPL ; 3. AER, Inc. ; 4. ITT Corp.	Column CO2 Airborne Lidar System	This ER-2 lidar instrument will address the specific needs for the measurement of atmospheric CO2 for field campaigns and Calibration/Validation of the Orbiting Carbon Observatory (OCO)	21 750000

Accelerating Operational Use of Research Data: Weather, Climate, and Ecological Forecasting

PI	PI Institution	Partners	Application	Key Data Set(s)
William Rossow	The City University of New York/The City College	NCDC	Continue a cloud climate data record at climate data center	ISCCP
Jorge Vazquez	JPL	SPoRT & WFOs in NWS Southern Region	Short-term marine weather forecast	GHRSSST-PP
Alyn Lambert	JPL	JCSDA, NCEP, GMAO	Medium-range weather forecast	AURA MLS
Victor Zlotnicki	JPL	NOAA NWS OPC and	Tropical analysis and hurricane forecast Hurricane center	altimetry
Andrew Thomas	University of Maine	Atlantic States Marine Fisheries Commission (ASMFC)	Lobster Settlement Forecasting in the Gulf of Maine	QuikScat, MODIS, AVHRR, SeaWiFS
Hongsheng Bi	NOAA - Fisheries (Oregon State University)	NOAA Fisheries	ecological forecasts of salmon returns in the northern California Current off Washington and Oregon	SeaWiFS, MODIS, SSH & SST

ROSES-2007 A.19 Space Archaeology Program

New program element

Proposals Due 7/25/2007

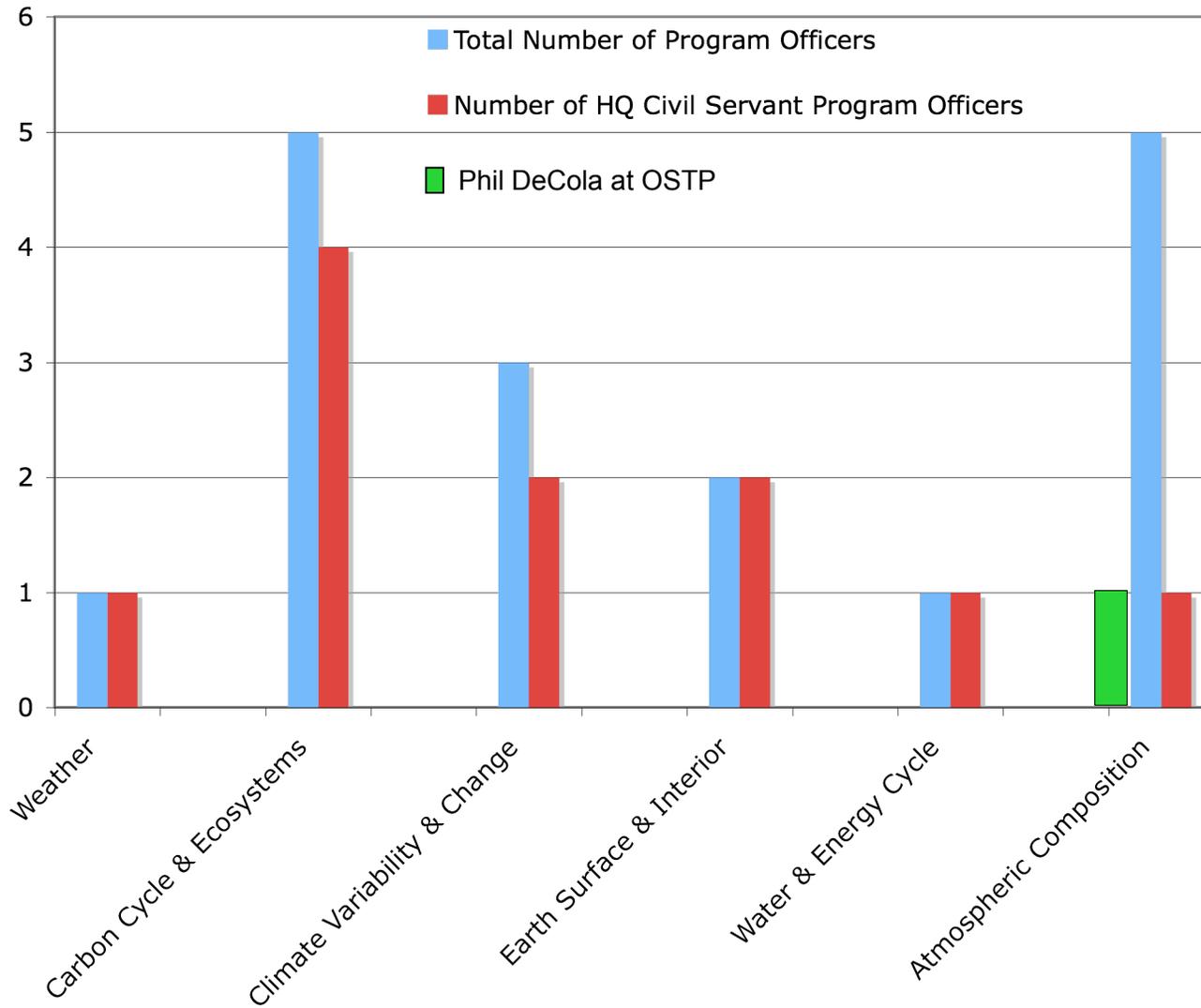
Selections 1/23/2008

17 received 7 selected

Total budget over 3 years \$1.9M

PI	Institution	Partner Institutions	Geographic Region	Issue(s)	Key Data Sets
Blom, Ron	JPL	Golden/Brandeis Univ., Comer/Cultural Site Research & Management	Guatemala	Landscape survey of Mayan Biosphere	NASA AirSAR and DEM
Buck, Paul	Desert Research Institute		Arizona	Survey of Anasazi agricultural patterns and dwellings	Landsat, ASTER, DEM
Comer, Doug	Cultural Site Research & Management	Tilton/GSFC, Blom & Chapman/JPL	N. & S. America, Asia, Mid-East	Automated process for archaeological site survey using remote sensing data	ASTER, Hyperion-ALI, JAXA- ALOS PALSAR, TerraSAR-X
Farr, Tom	JPL	Paillou/Univ. of Bordeaux	North Africa	Regional landscape survey of Saharan prehistoric habitation sites	ASTER, SIR-A/B/C, SRTM, JAXA-JERS-1, JAXA- ALOS PALSAR, DLR-TerraSAR-X
Middleton, William	Rochester Inst. Tech.	Joyce/Univ. Colorado	Mexico	Regional landscape survey of Oaxca	Hyperion-ALI, Landsat
Stark, Miriam	Univ. Hawaii Manoa		Cambodia	Survey of early historic landscapes of Mekong Delta	JAXA-ALOS PALSAR
Weishampel, John	Univ. Central Florida	Slatton & Shrestha/Univ. Florida	Belize	Mayan landuse features under tropical rainforest	Airborne LIDAR, Landsat

ESD R&A Program Officer Coverage by Focus Area



ROSES Element Due Dates

Due Dates for ROSES Elements

