National Aeronautics and Space Administration

Overview of R&A programs in other SMD Divisions (for context) – Max Bernstein, SMD R&A Lead

Topics

- Solicitation & Submission:
  - Introduction to ROSES omnibus
  - Number of calls (breadth/focus and edges)
  - Page length, award size
  - Deadlines
  - Exclusions, restrictions vs. duplicates etc.
  - Explicit statement of relevance
  - Data management plans
  - Two-step process
- Review
  - Which criteria get votes
  - Voting process range and granularity
- Award
  - Award duration, partial awards, pilot studies

ROSES Omnibus Solicitation

The Science Mission Directorate (SMD) solicits research via the "omnibus" Research Opportunities in Space and Earth Sciences (ROSES).

- "Omnibus" means some basic rules that cover all separate program elements (the actual calls for proposals) within ROSES, each with its own topic and due date. They are configurable, broad scope or focused, large or small and long or short awards etc.
- Another thing that can be changed is whether a preliminary summary of the research is merely requested (NOI) or required (Step-1 proposal) and the nature of the evaluation of the Step-1 (how exacting? Internal or external?)

Number of ROSES Program elements

- Earth Science (ESD): 30 in 2016, ~50 overall, including "Not solicited this year" reminders for calls that are solicited every 2nd or 3rd year.
- Planetary Science (PSD): 19 this year including the one off Concepts for Ocean Worlds Life Detection Technology.
- Astrophysics (APD): 9 (10 with Roman Fellowships, Not solicited this year).
- Heliophysics (HPD): 9 (increase from 6 last year)
- Also XRP Astro/PSD cross division program
- The number of calls doesn’t correlate with #s of proposals*

*Most years PSD gets (~20%) more proposals than Astro, but not twice as many. In fact, in 2012 Astro got more (APD got 1534 in ROSES 2012). Though many are small dollar value observing proposals they still have to be reviewed! The relationship between Earth and Planetary is similar to that between PSD and Astro: while ESD is ~20% higher in 2010 and 2011 PSD actually got more proposals.

Number of ROSES Program elements

As you might expect, in the divisions with fewer calls they are broader in scope, whereas Earth and Planetary have more calls that are more focused.

More calls means more borders between them, more questions about relevance and responsiveness, esp. with prohibition on duplicate proposals.

With a 2-step process a proposer, in theory, submits to the first and maybe redirected to the second. In practice it may not be obvious until the Step-2 proposal is submitted and then it maybe too late.

Page length and award size

Most ROSES program elements allow 15-page proposals and have no cost cap, only giving estimated total budgets and numbers of awards.

Budgets (award size) can be capped, or different caps can be set for different categories, and budgets can be pushed off until after a technical evaluation.

Like award size caps, page lengths can track project category. K2 Guest Observer program in astrophysics is a good example of this…

Page length and award size: K2 example

There are two categories of K2 guest observer proposals:
Small proposals—proposals requesting fewer than 1000 targets, with a budget capped at $50,000.
Large proposals—proposals requesting 1000 or more targets, with a budget capped at $150,000. Large proposals must also include the development and dissemination of a value-added community resource product.
There are two page lengths for K2 guest observer proposals:
Small proposals: No more than four pages for the Scientific/Technical/ Management section, including text, tables, and figures.
Large proposals: No more than six pages for the Scientific/Technical/ Management section, including text, tables, and figures. Up to an additional 0.5 pages is allowed to describe progress toward delivery of value-added community resource products by PIs with selected K2 GO Cycle 1 or Cycle 2 proposals.

Restrictions vs. duplicates, etc.

Appendices B & C (Heliophysics and Planetary) both bar duplicate proposals to different program elements at the same time.

Appendix B (Heliophysics) limits individuals to being PI on one proposal per call, but there is no limit on Co-Is.

In ROSES we sometimes restrict the award type e.g., a program element may say only cooperative agreements or no contracts.

We rarely limit the kind of organization that may apply (e.g., USIP was limited to universities)

We have not limited the number of times that a given proposal may be submitted.

Explicit Relevance Statement– PSD only

C.3-C.5 and C.10 require an explicit relevance statement, which will be collected in a mandatory (4000-character) text box on the cover pages via the NSPIRES web interface.

Unless otherwise stated in the call, relevance of the proposed work is judged based on whether the work proposed is deemed to be relevant, independent of whether or not it includes an overt, clear and direct statement of relevance. That is, unless otherwise stated in the call, no proposal will be returned as noncompliant for lack of a relevance section or statement, but inclusion of a relevance section or statement is no guarantee that the proposal will be judged relevant. A few program elements in Appendix C do require an explicit relevance section.

Relevance

C.5 EXOBIOLOGY

NOTICE: This Program Element requires an explicit statement of relevance, which will be collected in a mandatory (4000-character) text box on the cover pages via the NSPIRES web interface. See Section 2.1, below.

…the omission of this section is sufficient reason for a proposal to be returned without review.

The relevance discussion must explicitly refer to this program element and the section of the solicitation to which the proposal is responsive. If the proposed work is close in scope to research covered by any other program element, this discussion must also justify why it is more relevant to this program element than that other program element. This discussion may not be used to address the proposal's intrinsic merit, budget justification, or any other factor that remains in the 15-page main body, or any other section, of the proposal.

Data Management Plans – Not PSD

- Data Management Plans (DMPs) are required for most proposals to NASA (not technology programs).
- For everyone other than Planetary (including E.3 the cross division Exoplanets Research Program) the DMP is a short statement in a plain text box on the NSPIRES cover pages.
- This is not part of the grade or selection decision, but a revised DMP maybe required to make an award.
- DMP is not part of the page limited technical/scientific part of the proposal, they are separate.
- Exceptions are program elements that specify that its part of the evaluation of the proposal, e.g., D.2 ADAP, A.7 CMS, A.21 TE.

Appendix C Planetary

- There are special rules for proposals submitted to Appendix C, Planetary Science (including habitable worlds, which is now cross division E.4)
- Section 3.5 of C.1 the planetary overview adds DMPs as an appendix to the main proposal (as opposed to on the cover pages like other divisions).
- DMPs for Planetary Science must be placed in an up to 2-page special section of the proposal, entitled "Data Management Plan".
- Still not part of the grade except Planetary Data Archiving, Restoration and Tools (PDART, Program Element C.7) which includes the data management discussion in the body of the proposal.

Two-Step Process

- The two-step submission is a process in which the optional NOI is replaced by a required "Step-1 proposal", i.e., it is a prerequisite for submission of a full Step-2 proposal, but it does not obligate the offerors to submit a Step-2 (full) proposal later.
- As a proposal, it must be submitted by the Step-1 due date by the organization.
- This Step-1 proposal may be merely a required NOI, just a paragraph long for the program officer to get started on the peer review early, or it maybe a few pages long and peer reviewed.
- The two-step submission can be set up either non-binding, i.e., they may submit it even if it was discouraged by NASA, or it can be binding, in which case the full Step-2 proposal can only be submitted if it is "encouraged".
- The Planetary Science Division uses exclusively a non-binding two-step process. Feedback is just a quick compliance/relevance check, not a merit review.
- NASA does not tell the peer review panel whether the corresponding Step-1 was encouraged or discouraged, it has no effect.

Heliophysics 2013 as an example

- For the 2013 Heliophysics Supporting Research program 306 Step-1 proposals were submitted. Only 12 were discouraged as because they seemed non compliant. All 294 others (96%) were permitted to proceed.
- For the 2013 Heliophysics Guest Investigators (H-GI) program 174 Step-1 proposals were submitted. Only 73 were encouraged and only 83 submitted Step-2 proposals. 22/83 (=27%) were selected.
- The discouragement made a difference to the proposers
- In 2013 None of the proposals discouraged at Step-1 were selected for funding at Step-2, so it seems that the evaluation of the Step-1 was a good predictor.

Heliophysics 2014 SR as an example

- For the 2014 Heliophysics Supporting Research program 323 Step-1 proposals were submitted. 168 were encouraged and 221 submitted Step-2 proposals. Of those 221 Step-2 proposals, 166 were encouraged at Step-1 (and 55 not).
- Overall 39 (~18%) were selected.
- Of the proposals discouraged at Step-1, 28% were in the competitive range and 11% were funded at Step-2.
- Of the proposals encouraged at Step-1, 38% were in the competitive range and 20% were funded at Step-2.
- This suggests that the Step-1 is a fairly good but imperfect predictor of the success of the Step-2, since some of the Step-1s that were discouraged were followed up with successful Step-2 proposals (~1/3 submitted a Step-2 and only 10% of those were successful).

Planetary Science 2014

- The Planetary Science Division (PSD) research program was restructured in 2014. Core calls organized by object (Mars) or part of an object (Atmospheres, Geology) that had been solicited for years were replaced with new ones that align with Planetary Science Division goals (Emerging Worlds, Habitable Worlds, Solar System Workings) and focus more on process.
- There was anxiety in the community as many asked to which program they should submit their proposals.
- PSD required (up to one page maximum) Step-1 proposals for almost all calls and the (internal) evaluation focused on whether proposals had been submitted to the right call. PSD discouraged ~100 out of 1500 Step-1 proposals but recommended that these be sent to other calls within PSD based on relevance.
- None of the Step-1 proposals were evaluated for Merit.

Specific Examples from PSD 2014

- Planetary Data Archiving, Restoration, and Tools got 143 Step-1 proposals 14 of which were discouraged and redirected.
- Of the 129 encouraged only 100 were received but 5 more came in from other programs. 23/105 (22%) were selected. 2 out of the 5 redirected from other programs (SSW and LDAP) were selected.
- Other Examples:

  Cassini Data Analysis: One (of 101) discouraged as non compliant

  Discovery Data Analysis: One (of 32) redirected

  Emerging Worlds: 19 (of 219) redirected and 4 non compliant

  Exobiology 9 (of 186) redirected

  Lunar Data Analysis 8 (of 82) redirected

  Planetary Science and Technology Through Analog Research 14 (of 69) redirected

Some Proposals Moved after Review

- The Cassini Data Analysis and Participating Scientist (CDAPS) Program received 101 Step-1 proposals, 1 of which was discouraged as non compliant.
- Of the 100 encouraged at Step-1, 78 were received as Step-2 proposals. 18/78 (23%) were selected.
- However, two proposals that were submitted to and reviewed by Solar System Workings and were found to be of excellent Merit were forwarded to CDAPS. These were assessed by the program scientist for Relevance, and were also funded by CDAPS.

Peer Review - Criteria

- The three standard peer review criteria are Merit, Relevance (to the program) and Cost reasonableness and realism.
- Merit always gets a peer review and a vote on a full 5-point Excellent to Poor scale.
- Relevance always gets a peer review but if there is a vote it may be maybe on a truncated (1,3,5 or Y/N) scale with comments.
- Cost realism and reasonableness usually gets a peer review but if there is a vote it may be on a truncated (1,3,5 or Y/N) scale, or there maybe no vote at all, just comments.

Peer Review - Voting

- Astrophysics panelists vote via secret ballot, not seeing the average scores until the xl spreadsheet is projected.
- All other divisions vote openly and simultaneously.
- Some program officers only allow integer scores.
- Most panels are permitted half votes e.g., 3 = Good, 3.5 = Very Good/Good, 4 = Very Good, etc.
- Astrophysics panelists vote down to the tenth e.g., 3.1
- Final result should be at least one adjectival rating (some evaluations contain one for each criterion, some for just Merit or just an overall score).
- Non-governmental people may not rank order proposals, they grade each one separately vs. an absolute scale

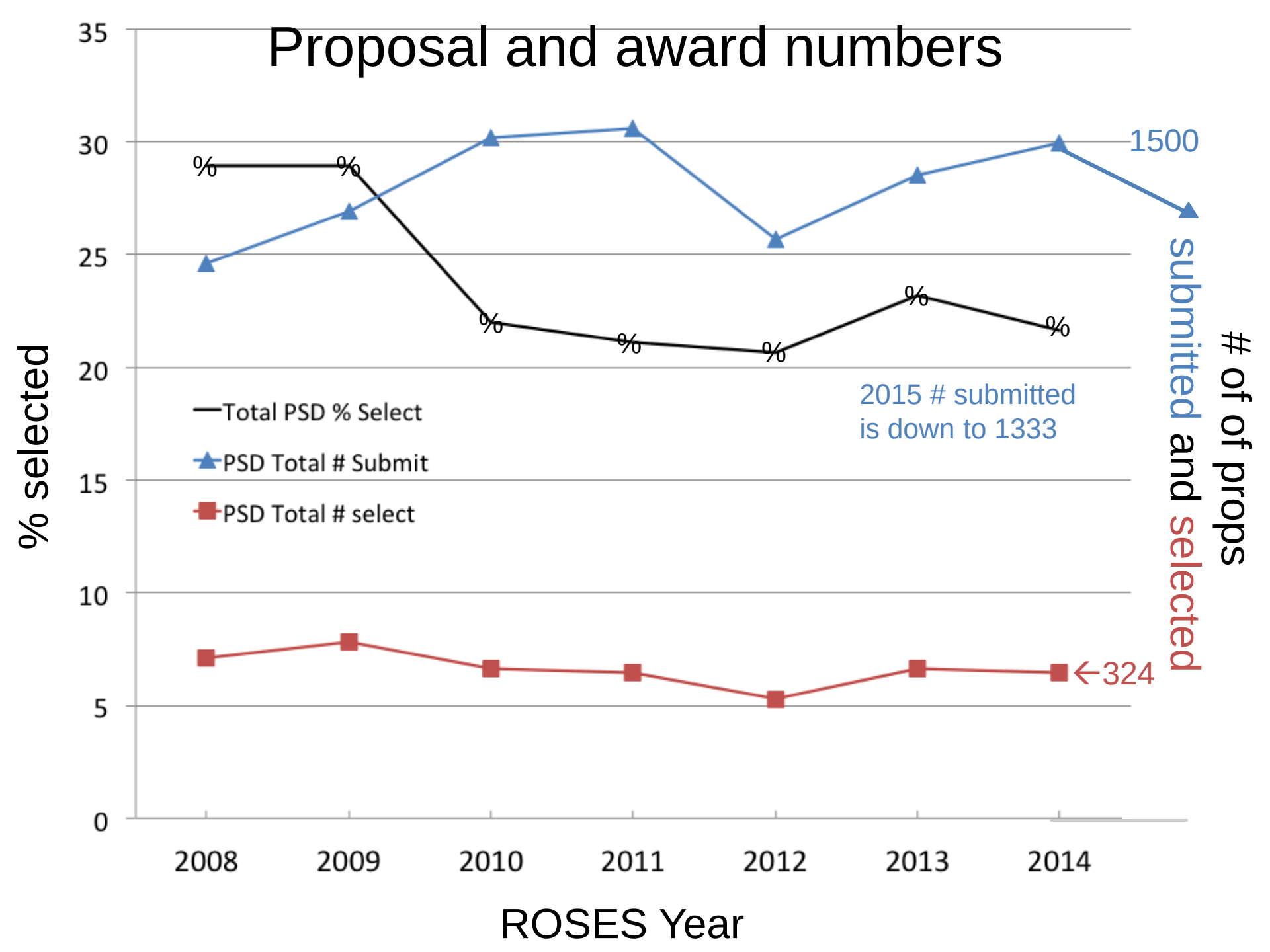
Awards – duration

- Maximum award duration is specified in the solicitation.
- Planetary Science mostly allows awards of up to 4 years but there are exceptions (SSO-5, PDART-3, CDAP- 3 PICASSO-3, COLDTech-2).
- SMD may award as outlined in the proposal, may offer to fund only selected tasks, or all tasks for a shorter duration (e.g., a one year pilot study), or a combination.
- I think that all peer reviewers are aware that they may consider these options, voting again on only selected tasks or a pilot study, but this is not done often.

Awards – selection rates

- A spreadsheet with numbers of proposals submitted and selected are available on the web.
- Jim Green correctly noted that the selection rates for the planetary science division have typically been as high or higher than the rest of Space Science. For the past few years its been 20-25%. This is complicated, esp. in Heliophysics by the binding two-step process*
- ROSES 2014 is the last year for which we have complete data since some of the late programs in ROSES-2015 are not yet done (SSW, HW & PPR), but we know how many proposals were submitted, which is the largest factor…

* We typically report selection rates based on Step-2 proposals but in Helio where some programs are binding, we should compare to the Step-1 proposals.


Proposal and award numbers
35
30
25
20
15
10
5
0
% selected
# of of props
submitted and selected
1500
←324
2015 # submitted
is down to 1333
Total PSD % Select
PSD Total # Submit
PSD Total # select
%
2008
2009
2010
2011
2012
2013
2014
ROSES Year

SARA

- This data is from the spreadsheet on http://sara.nasa.gov
- This web page has other information for proposers like contact information for program officers
- Confidential questions/complaints may be sent to sara@nasa.gov
- The Planetary Science community is by far the one that participates the most, they are not shy about providing input.
- Deputy SARA is Christina Richey who is a program officer in Planetary Science
- We have given talks at numerous organizations that submit proposals to ROSES, esp. Planetary.