Evaluation 2019: Paths to the Future of Evaluation: Contribution, Leadership, and Renewal

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Session Title:	Using Arcane Data: Past Performance in NASA Science's Principal Investigator (PI) Development Programs and Improving Future Peer Review for Space Flight Missions
Session Number:	1764
Track:	Research, Technology & Development Evaluation (p/es/sx/etid=793)
Session Type:	Panel
Initial Submission:	Mar 18, 2019 10:47 AM America/Eastern
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Submitter:	Mary Frances Sladek (p/us/sn/uid=13877)
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Session Abstract (150 words):	This panel will explore challenges and initial findings from three qualitative studies that use the National Aeronautics and Space Administration's (NASA) Science Mission Directorate's (SMD) internal administrative data to begin to assess program effectiveness and document outputs and outcomes. SMD has funded both at and outside NASA, projects that promote the development of SMD's future principal investigators (PI) workforce and science and technology investigations on space flight missions that advance the high priority science, technology, and exploration objectives. NASA's internal administrative data are arcane because they developed outside of relational databases. The studies reveal unique challenges to locating and using these data to document effective program processes, i.e., peer review criteria for large flight missions, and results from the PI-development projects, e.g. the Hands-On Project Experience (HOPE) Training Opportunity solicitations limited to NASA Centers the Jet Propulsion Laboratory; and graduate student/postdoctoral opportunities at higher education institutions.
Relevance Statement:	Three of Tessie Catasambas's written/video reflections on 2019's Theme inspired this proposal: 1) First we want to honor the past. 2) How do we help our organization to be more competent? 3) Our role as evaluators is to increase our society's capacity to make better decisions based on credible evidence. Study 3 uses factor analysis to evaluate spaceflight systems criteria contributing an application of factor analysis beyond its historical use in psychology, education, and healthcare (Williams, Onsman, & Brown, 2010). While focused on a logic model, study 1 also appreciates Arnold J. Love's classic: Internal Evaluation: Building Organizations from Within (Applied Social Research Methods) 1991. This proposal is sharing evaluation grey literature from NASA: http://www.greynet.org/home/aboutgreynet.html The relevance and importance of this proposal primarily is to explore the value of small-scale evaluations as practiced internally in a research and development agency without a dedicated Evaluation Program at the agency-level. NASA has some history evaluating Congressionally-directed STEM education programs/projects. Likewise, the Science Mission Directorate or SMD's decades' long investment in education and public outreach, now Science Activation, requires third-party evaluators and logic models for its grant cooperative agreements. Historically and currently, however, evaluation of the SMD's research programs, processes, and/or projects, relies on scientists and engineers and contracted expert studies by the National Academies/National Research Council. The three studies featured in this proposal are helping SMD's senior research policy makers learn what works and what might work better, i.e., helping to make SMD a more competent organization. All three researchers work with SMD's Deputy Associate Administrator for Research (DAAR). The DAAR ensures the integrity of SMD's research processes, including oversight of scientific competition for research awards and flight programs; and represents SMD research programs and policies inside and outside NASA, e.g., SMD's relationship with the National Research Council. The proposal described in the abstract adds knowledge to evaluation practice. Two of SMD's internal evaluators are attempting to use messy and miniscule amounts of

	administrative data to assess program effectiveness. Although this proposal is not focused on evaluating women in STEM programs, the Government Accountability Office identified the major challenge to using NASA administrative data. Per GAO-16-14: WOMEN IN STEM RESEARCH: Better Data and Information Sharing Could Improve Oversight of Federal Grant-making and Title IX Compliance: “Data limitations at NASA prevented GAO's analysis of success rates altogether. This lack of complete, linked electronic proposal and award data at NASA and some components at DOD and DOE impacts their ability to fully evaluate their programs' performance against their stated goals of funding the most qualified scientists, irrespective of gender.” Reference: https://www.gao.gov/products/GAO-16-14 The two of the three presenters (Thompson and Daniels) are new to Research, Technology and Development evaluation and to AEA. The submitter (Sladek) has been a long-time AEA and Federal Evaluators member, but has not submitted a proposal to AEA since leaving the NSF for NASA in 2007. The Chair/Discussant (Martin) is Project Manager, Evaluation/ Scientific Assessment and Workforce Development, Oak Ridge Associated Universities and TIG chair, STEM Education and Training.
Session Facilitator:	[Unassigned]
First Author or Discussion Group Leader:	[Unassigned]
Second Author or Discussion Group Leader:	[Unassigned]
Third Author or Discussion Group Leader:	[Unassigned]
Fourth Author or Discussion Group Leader:	[Unassigned]
Other Authors:	
Session Chair:	Ann M. Martin (p/us/sn/uid=22882) Oak Ridge Associated Universities Evaluation Specialist 4/Project Manager
Discussant:	Ann M. Martin (p/us/sn/uid=22882) Oak Ridge Associated Universities Evaluation Specialist 4/Project Manager

Presenter 1:	Mary Frances Sladek (p/us/sn/uid=13877) NASA You are currently missing the following information from your user profile: **Job Title**. Please click here (p/us/sn/uid=13877) to update your profile information.
Abstract 1 Title:	A Post-Flight Recovery Mission: Using Administrative Data from a Science Principal Investigator (PI) Leadership Development Program to Support NASA Policy-Maker Decisions
Presentation Abstract 1:	Can a program history of the internal-to-NASA-and JPL-training opportunity called the Hands-On Project Experience (HOPE) recover enough administrative data from the past and present so leadership in the Science Mission Directorate (SMD) can decide whether HOPE met its goals? HOPE's primary goal was to enhance the technical, leadership, and project skills for the selected NASA in-house project teams. HOPE's secondary goal: To fly an Earth or space science payload having a useful purpose for SMD, i.e., one or more of the SMD Science Divisions. SMD was the primary funder in collaboration with NASA's Chief Engineer. The Academy of Program/Project and Engineering Leadership (APPEL) and the Science Office for Mission Assessments supported individual teams and mission implementation, e.g., participant surveys, lessons learned, etc. The author tests whether a logic model for HOPE provides sufficient evidence using internal and open sources to document the investment's leadership development and science outputs and outcomes.
Presentation 1 Additional Author:	[Unassigned]
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Presentation 1 Other Authors:	
Presenter 2:	Meagan Thompson (p/us/sn/uid=55576) This user is currently missing the following information from their user profile: **Affiliation, Job Title**. Please contact them and have them update their profile information.
Abstract 2 Title:	Searching Within and Outside NASA for Evidence of Educational and Career Success in Planetary Science

Presentation Abstract 2:	This study explores NASA Earth and Space Science Fellowship (NESSF) recipients in the planetary sciences compared to non-recipients and the general STEM population. The two researchers (Byrne and Thompson) began with internal NASA records and its public website. NESSF applicants' current positions (as of 2017) were collected via internet searches. Analysis of the data collected for this study indicate that both selected and not selected NESSFs go on to experience lower unemployment and higher degree completion than the general STEM graduate student population. Between the selected and not selected proposals, selected Fellows were more likely to remain in the field of their graduate study and complete their Ph.D. The authors found NESSF applicants, after their degree completion, appear to experience similar levels of career success. Other findings suggest that by increasing their chance of completing their Ph.D., the NESSF program has met the goal of supporting the best/brightest students' research.
Presentation 2 Additional Author:	[Unassigned]
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Presentation 2 Other Authors:	Sarah Byrne, Mount Holyoke College (Student)
Presenter 3:	Cindy Daniels (p/us/sn/uid=55696) NASA Langley Research Center Director of the Science Office for Mission Assessments
Abstract 3 Title:	Assessing Peer Criteria for Space Flight Systems of Diverse Mission Concept Designs
Presentation Abstract 3:	Over 350 records from past peer reviews of proposed mission concepts were assessed using a five-level qualitative rating scale. Mission concept review objectives in NASA's Space Flight Program and Project Management Handbook, are: "To evaluate the feasibility of the proposed mission concept(s) and its fulfillment of the program's needs and objectives. To determine whether the maturity of the concept and associated planning are sufficient to begin Phase A." Between 1996 and the present, scientists, engineers and technologists (SET) developed 23 proposal criteria, 16 for assessing space flight systems and seven for assessing mission design and operations. No previous research has been carried out to test the SET experts' assumptions that all 23 of the evaluation criteria are necessary. This research identifies a reduced set of criteria that will enable NASA's leaders for space flight systems to make decisions more efficiently by only focusing on the most important criteria.
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Presenter 4:	[Unassigned]
Abstract 4 Title:	
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Abstract 5 Title:	
Presentation Abstract 5:	
Presentation 5 Additional Author:	[Unassigned]
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Presentation 5 Additional Author:	[Unassigned]
Presentation 5 Other Authors:	
Audience Level:	All Audiences
Session Length:	60 Minutes

Poster Alternative:	YES, I would like it to be considered for a Poster presentation if this presentation cannot be scheduled as proposed.
First Additional TIG:	Internal Evaluation
Second Additional TIG:	Government Evaluation
Other Information:	
Session Chair:	Yes
Choice 1:	Assessment in Higher Education
Choice 2:	STEM Education and Training
First Time Proposer:	No
Student Status:	No
aea365:	No
Expectations:	Yes
Tag(s):	case study | evidence based decision making | NASA | output | Performance | process improvement | Project and data management | Science

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