NASA EPSCoR Near Term Plan – 2021

NASA EPSCoR Caucus Executive Committee
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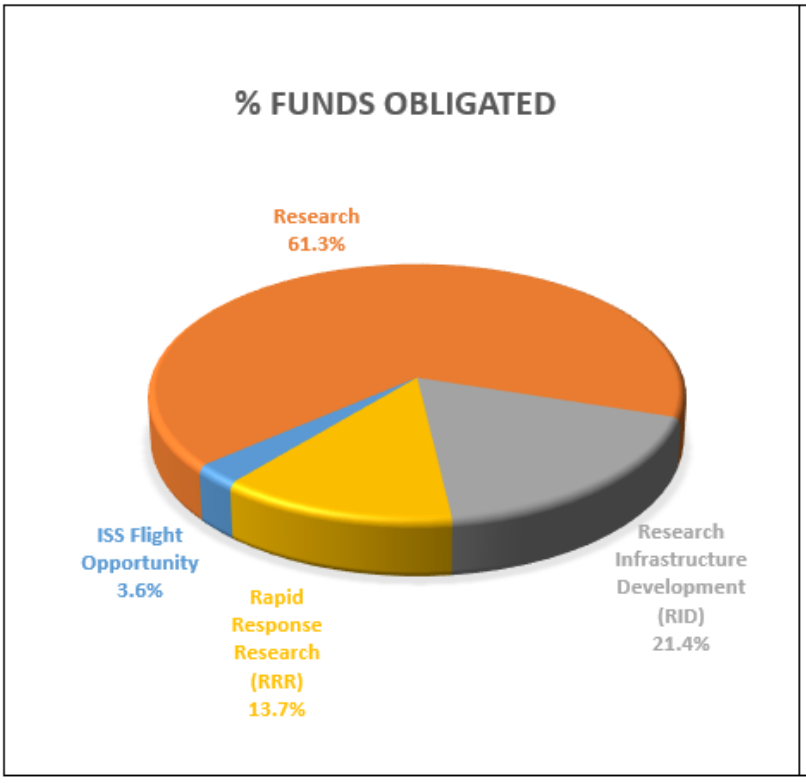
The Current NASA EPSCoR Portfolio

Programs under the current NASA EPSCoR portfolio, managed by Jeppie Compton based at NASA Kennedy Space Center, have a proven substantial jurisdictional impact in meeting the EPSCoR goals of building NASA-related research capacity, connecting diverse researchers to benefit NASA missions, and creating economic opportunities. This portfolio-of-programs approach also offers scalability for growth and flexibility for jurisdictional adaptation that has contributed to the jurisdictional impacts and national success.

Current programs include the following 4 elements: Research Infrastructure Development (RID); Research Implementation CAN; Rapid Response Research (R3); and the ISS Flight Opportunity. The chart below shows the FY20 distribution of EPSCoR awards between the 4 elements, including administrative expenses, with approximately the following numbers of awards: RID 28, Research 16, R3 26, and ISS 7.



Project Elements (Funds Obligated)	
ISS Flight Opportunity	$699,556.00
Research	$11,999,805.00
Research Infrastructure Development (RID)	$4,200,000.00
Rapid Response Research (RRR)	$2,688,000.00
Total	$19,587,361.00

In addition, two pilot programs were implemented for FY 2021:
1) Fellows Advancing in Science and Technology (FAST) a joint NSF-NASA 2-year pilot program funding ten EPSCoR teams, each consisting of an MSI researcher and assistant to work in a NASA Lab at a NASA Center. NSF EPSCoR will provide up to $3,000,000 and NASA EPSCoR will provide $600,000 plus in-kind support.

2) The addition of a joint NASA EPSCoR – NASA STMD Suborbital Flight Opportunity to the ISS Flight Opportunity solicitation. This addition will provide opportunities to fly experiments on a balloon flight, parabolic flight(s), rocket flight, or a lander flight. This is a 3-year pilot wherein NASA EPSCoR will fund the research, up to $600,000, and STMD will cover all flight costs (TBD).

The success of the NASA EPSCoR program under the existing portfolio has generated increased NASA-related research interest in jurisdictions, persuaded NASA Mission Directorates that NASA EPSCoR can help address mission needs, and demonstrated how partnerships with EPSCoR programs in other federal agencies can be impactful. Since 2016 the annual NASA EPSCoR Stimuli publication has highlighted award success across all NASA EPSCoR programs by presenting significant results by jurisdiction and NASA priorities. Abstracts of portfolio awards since 2014 are also available (www.nasa.gov/stem/epscor/home/index.html).

Building collaborations and multidisciplinary team networks between NASA and jurisdiction researchers has been facilitated by program requirements, with effective research communications and through several successful NASA center Technical Interchange Meetings (TIMs). However, brokering these connections requires continuous imaginative and forward-looking leadership, which Jeppie Compton has successfully provided. As a result of these on-going efforts, NASA EPSCoR has accumulated a foundation of experience to build on for interdisciplinary team-science. Future directions across many NASA's missions and interests include complex large-scale challenges that would benefit from the scalable/flexible capacity and multidisciplinary collaboration expertise of NASA EPSCoR jurisdictions.

Expanding NASA EPSCoR to Address NASA & Jurisdiction Needs

In the immediate future we plan to develop new NASA EPSCoR efforts in the following areas:

The new **Suborbital Flight Opportunity Program** will build upon the existing NASA EPSCoR ISS Flight Opportunity, enabling jurisdictions to develop payloads for flight on suborbital vehicles (e.g., sounding rocket, high altitude aircraft, parabolic flight aircraft, high altitude balloons, and reusable launch vehicles) supported by both STMD and SMD. This enables jurisdictions to advance the technology readiness of science instrument concepts or test space technology prior to flight to low Earth orbit or beyond. Scientific investigations of the atmosphere or geo-magnetosphere can also be directly conducted with suborbital flights. This opportunity will improve jurisdiction research infrastructure and support both STMD and SMD objectives. Anticipated awards will provide up to $250,000 per 3-year project, with associated suborbital flight costs provided by STMD and SMD for selected projects.

A **Supplement to the R3 Program** is designed to expand opportunities for specific research tasks leading to practical outcomes identified by particular offices in the NASA Mission Directorates. As each R3 task is associated with specific NASA Center researchers, this NASA EPSCoR program is particularly effective in establishing jurisdiction / NASA Center research partnerships. For these reasons, the R3 program has generated considerable interest both at NASA and in the jurisdictions. Supplementing this program would enable more jurisdiction / NASA collaborative

projects to be funded and multiple-year funding for particularly promising research. Feedback from the researchers and NASA partners has indicated that a 2-year $200k award is more appropriate to the completion of these tasks.

A new **Multi-Jurisdiction Research Collaborative Challenge** program is envisioned that will leverage NASA EPSCoR's scalability to address complex future research with an initiative to coordinate capacity and infrastructure enhancement across the U.S. Successful examples in other agencies include: NSF Big Ideas (e.g., human-robotic interaction) and NSF EPSCoR Track-2. For NASA EPSCoR, a variety of project ideas are possible, such as collaborations to build nationwide data science capabilities for space science and technology applications for future telescopes (e.g. LSST/Vera C. Rubin Observatory or an Arecibo replacement collaboration). Pilot projects of $250k could work closely with NASA / other agency researchers to address prospective challenges, supporting awardees to develop plans for larger multi-jurisdiction proposals. The pilot program would award up to three multi-jurisdiction vetting studies, from which one multi-jurisdiction $3M project could be selected.

Diversity Focused Program: Fostering diversity and inclusion within NASA EPSCoR jurisdictions is important, so we plan to partner with Minority Serving Institutions (MSIs) and other organizations in our jurisdictions to develop unique jurisdiction-focused projects that meet NASA EPSCoR research capacity and partnering objectives. A primary goal would be the enhancement of research capacity and student research experience at MSIs. Pilot awards in FY22 will establish directions for expanded success in following years.

A new **Joint Program with EPSCoR Agencies** will help NASA tap specialized expertise in other agencies to assist in meeting complex interdisciplinary challenges for NASA's missions. Future challenges faced by NASA overlapping with other national agencies who have complementary mission interests involve almost all areas of science, engineering, and human interaction. NASA has recently teamed with NSF to demonstrate the value of partnering for research capacity-building. Thus, new NASA / Agency-EPSCoR Research Programs would support incubation of collaborative efforts between jurisdiction and agency (DoD/DoE/other) laboratory researchers advancing several themed research projects for NASA priorities (e.g., nuclear thermal power, advanced aerial mobility, gravity wave observations, orbital debris, atmospheric physics, quantum computing, artificial intelligence, etc.). Of particular interest as a potential first theme would be the development of a deep space exploration research program to study the impact of human-machine interfaces, health hazards, space manufacturing technologies and transport of massive amounts of mined materials back to Earth. The award size/duration for these types of collaborations would be dependent upon the available budget from each of the involved agencies. No budget request is included at this time.

Anticipated Budget Needs

The current NASA EPSCoR budget is $26M supporting the four standing programs and two pilots in FY21: RID (28), Research (16), R3 (19 at $200k/ea), ISS (0), Suborbital (replacing ISS((4). In addition to these, the FY 22 request draft below includes programs as follows: Multi-jurisdiction Pilot (MJP, 3 at $250k/ea), Multi-jurisdiction Award (MJA, 1 at $3M/ea), and Diversity Focus (DF,

5 at $284k/ea).

Program	Allocation per year	Number		
RID	$ 200,000.00	28	$	5,600,000.00
Research	$ 1,000,000.00	16	$	16,000,000.00
R3	$ 200,000.00	19	$	3,800,000.00
Suborbital	$ 250,000.00	4	$	1,000,000.00
Multi Jurisdiction planning	$ 250,000.00	3	$	750,000.00
Multi Jurisdiction award	$ 3,000,000.00	1	$	3,000,000.00
Diversity/inclusion	$ 100,000.00	1	$	100,000.00
Agency Partners (DoE, etc)	varies with partners	1	$	150,000.00
Admin	$ 1,000,000.00	1.6	$	1,600,000.00
			$	32,000,000.00