

The transcript of the Earth Science Community Forum held on March 13th, 2024. Times are given in parentheses correspond to the recording of the Forum. The slide numbers refer to the slide deck and both the slide deck and the recording are available at

Speakers are identified by name (in bold) whenever the speaker changes.

Slide 1-(00:00:06.990) **Wendy Mihm**

All right. Good afternoon or good morning everyone, depending on your time zone. Thanks so much for joining our Earth Science Division Community Forum. My name is Wendy Mihm. I'm the communications lead and I'll be serving as your MC today. Our last Community Forum was back in September of 2023, so it's really great to have everybody in this science community back together again. We really appreciate you making time for us today. Our main speaker will be the Earth Science Division Deputy Director, Dr Julie Robinson. She's going to be stepping in for our Director. Dr Karen St. Germain who is away today to attend to a family health emergency. So, Julie will walk us through the latest here with a big focus on the budget because that's so top of mind for so many of us right now. But before then, let's do some housekeeping. So, Maria, if you could send us over to the housekeeping slide. That's perfect.

Slide 2 (01:04)

Right there. So, on the top there, you'll see closed captioning is available. There's a little quote, bubble icon on the bottom left of your screen. You can just click that to access that feature. This part's important. If you have any questions, please, don't enter them into the chat, but rather enter your questions into the little Q&A functionality as a Q&A box. If you look really carefully at the bottom, right hand side of your screen, there are 3 little dots. You want to click on those little dots there and that and select Q&A and that will put you into the Q&A area. And that's where you can put in your questions. We will do our best to address as many of those questions as we can. We may not get to them all due to time limits. I also want to let everyone know that this session is being recorded and that recording as well as the slide deck and the full transcript of our forum today is going to be made available as usual on our Community Forum webpage

Julie's going to take us through as much as she can today with the focus again, as I mentioned, on the budget. But the deck that we will post will actually have additional content that we wish we had time for here. So, you can look for that when we post that in the coming week or so. All right. So, without further delay and let me hand it over here to my boss Dr. Julie Robinson.

Slide 3 (00:02:33.703) **Julie Robinson**

Thanks so much Wendy, and I want to start with a shout out to my friends and colleagues here at NASA Ames Research Center. We are here with the Earth Science team and with the leadership of all five of the NASA centers that support Earth Science work, for other meetings. And, we're just joining you from an auditorium which is a really nice level of energy to have compared to normally all being in separate offices on Webex. We are happy to take some additional time, especially coming off of the SMD Community Forum to talk to you about the FY25 President's Budget submit that just came out as well as the FY24 appropriation that we received that was signed into law over the weekend and what that means for Earth Science

So, I'll talk about that budget in context of priorities. I'll give you a few highlights and a few details over the things we know you are most interested in getting additional details about. There is in the President's Budget release, a lot of information that the leadership here writes to

put out in that. So I do encourage you to download and look at the book also as a source of information in addition to these charts and the questions that we answer. So, 1st, let's go to the budget in context. If we could go to the next chart.

Slide 5(00:03:52.920)

So this graph in blue shows you the actual appropriations since 2018, FY2018 and then in green the FY2025 President's Budget request. And as you can see in FY2024 our appropriation was basically equivalent to our FY2023 appropriation. But other than that, and this is really important to thank our congressional stakeholders for the amazing support that they have for Earth Science. You can see that overall our budgets have been going up. That, as we look into the FY2025 budget, we see a growing Earth Science budget, and that's really important to our community because of the formulation of the Earth System Observatory that's going on as well as the initiation of Landsat Next that's going on. Both of those are major observation efforts that are the foundation of the Earth Science that we will do in the decade to come.

Now, the challenges that we're seeing in this budget, don't exactly appear on this chart. But if you are a watcher and a cross-tabulator, you could look back at last year's, FY2024 President's Budget request and you would see that those out years are much higher numbers. And so that is the challenge that we had to address in this budget. Over the last few years, the money that we believed was needed for implementation of the Earth System Observatory missions exactly as they had been envisioned at their mission concept reviews was getting kind of snow plowed or pushed to the right. In the current budget environment, we're in a situation where we have bipartisan agreement on some of these top lines, and we needed to find some smart ways to bring some of the costs of those missions down. We did not want to compromise the overall science of the Earth System Observatory and that vision of all disciplines, all of those major systems of the Earth having the next generation of observations. And so some of the changes you'll see in that budget link to that context.

Slide 6(00:06:03.749)

We can go to the next chart. So we had 3 priorities in looking at this budget. And the 1st one, I already alluded to. It is really making sure that we could still sustain and carry forward on our high priority science objectives within that cost constrained environment and that included the integrated missions of the Earth System Observatory, especially GRACE-C, formerly known as Mass Change, which is moving through formulation, the Atmospheric Observing System and Surface Biology and Geology.

As well as still advancing and preserving the continuity of Landsat Next, which is the continuity of Landsat missions for the next decade. In addition, we took the feedback from the National Academies review of Earth Venture and we tried to even out that cadence now that we have Earth System Explorers and Venture. So that there aren't clusters of opportunities all in one year, and then nothing for a long period afterward to make a much more viable and proposable cadence of those opportunities.

And then, this budget proposes the establishment of a Responsive Science Initiatives program. This is a way of consolidating a wide variety of activities that were across the science portfolio that were focused on getting information about our changing planet in forms that were usable, especially by other government agencies in their work and also, by other organizations that are delivering information to end users that could make decisions or be more resilient in the face of climate change. And so those efforts are consolidated together, they often have complex inter-agency partnerships and by managing them as a whole, we can be more agile and more able to interface with both users and to develop the right partnerships and inter-agency agreements.

Slide 8(00:08:01.109)

Next chart. So a few highlights across that budget and those of you who tuned into the SMD Town Hall will have heard a couple of these. In the Atmospheric Sciences we are doing some restructuring of the Atmospheric Observing System architecture, but we are trying to protect as much science as we possibly can, and I'll have a few more charts and a few more details about that. So we're including the highest priority observables, and multiple missions are still there. But now, instead of a completely directed program, we're proposing a mix of directed, and at least one competed mission and we're decoupling the schedules. So, instead of having everything fly at once, which is very expensive, because if you fly all the instruments at once, that means the mission has to wait until your last instrument is ready to go. As a way of being more cost effective, in these out year budget profiles, by having multiple missions, we can launch them when ready and still have significant overlap and significant integrated science, but at a lower cost point.

We protected continuity of precipitation measurement. We have done that for over a decade now, in collaboration with Japan, going clear back to the TRMM mission. And that is the only measure of global precipitation around the world. So that collaboration is really important for understanding the state of the Earth system. And that partnership is protected with Japan. We also expanded and are using additional partnerships to achieve the objectives of both Atmospheric Science and Surface Biology and Geology. We also decoupled the thermal imager contribution to an Italian mission from the imaging spectrometer in the main mission that was part of SBG, the VSWIR part. And Surface Deformation and Change, we did discontinue the ongoing study because we're getting ready to launch NISAR and NISAR delivers that observable. We're going to learn so much that we will completely think about those observations and how to do that science differently after we get a couple of years of NISAR data under our belt. So, we did all of those things to keep the Earth System Observatory together and advancing forward.

At the same time Landsat Next. The leading item that would keep it from getting to orbit in time .to provide good continuity, is the acquisition of the instruments themselves. And so, we kept to that procurement going forward. That's an open procurement and we needed to make sure that the FY2025 budget supported that. And then, as I mentioned before the Venture and Explorer cadence will better support proposal development across our entire community. Next chart.

Slide 9 (00:10:54.389)

We did extend all of our operating missions, as most of you know this from the letters that have gone out for each of those missions over the last few months. In particular, Terra, Aqua and Aura were an area of community emphasis and importance and those missions are now extended to the end of their life. So once they get to a point where they don't have enough fuel and we need to passivate them, they'll end. They don't ever come back to Senior Review again. These missions will operate to the end.

The budget supports critical research applications, data and technology activities, linked to the updated mission schedules. It does consolidate some mission science teams, not to make things harder, but to make it easier for those missions to collaborate. Sometimes we had very specific sub-discipline science teams and we want to enable more collaboration and, and more ready management of those overall science teams.

I mentioned the Responsive Science Initiatives program. We are also doing a sustained budget, which includes an increase for inter-agency satellite observation needs. That's the process by which other government agencies tell us the information they most need to inform the services

that they provide to the U. S. taxpayer. We doubled our investment in Geodesy infrastructure, which is particularly critical, that aging infrastructure supports every satellite in orbit around the Earth that needs accurate Earth positioning in order to be successful. And so that is a capability that NASA provides that is that is important, and we needed to sustain that infrastructure. And there's new content in our Earth Science Technology to begin developing the 1st space borne quantum gravity gradiometer

Slide 10 (00:12:34.189)

Next chart. So our approach to this budget request is grounded in the guidance we received from the National Academies. In particular, increasing the impact of Earth science for the response to climate change. And so that's part of why you see the new Responsive Science Initiatives program and other emphases in our Earth science portfolio. And we'll be continuing to talk about those in the coming weeks. A few more details on Responsive Science Initiatives on the next chart.

Slide 11 (00:13:07.169)

It is primarily created by realignment, so we didn't cancel other things and create something new. We really rearranged and consolidated the management of similar types of activities and that similarity is when they're connecting user needs with NASA remote sensing observations to provide trusted information that supports decision making, or information transfer across other agencies, or also in international forums. And so it emphasizes a cross-cutting approach amongst different projects.

A few principals there: One is scaling those successful demonstrations. So something that is incredibly useful, that is a demonstration project in one part of our portfolio. We want to be sure we're ready and thinking about how do we expand that activity to benefit more people perhaps with relatively little additional investment, perhaps with a partner that is really motivated to help people respond to our changing planet. Another aspect of this portfolio is focusing on the user in identifying the needs, for example, interviews and discussions with other federal agencies, international agencies and state, local and tribal governments.

And as I mentioned, there's no impact or reduction in the current competed R&A, Applied Sciences or Technology associated with creating this program. There are six major projects there:

One is cross cutting activities, which are a variety of things that are in development and starting to demonstrate their sustained work.

Inter-agency satellite observation needs, which was formerly known as Satellite Needs Working Group, Agriculture, Wildfires. There will be a new Responsive Science Initiatives research program, which helps us to identify things that users want information about that we actually don't know, because we didn't ask that scientific question yet. So, that gives us a really important feedback into our research programs where we have a place to work with the academic and the broader NASA community to answer new questions that arise from these user engagements. Then, our Commercial Satellite Data Acquisition program will also be there so that we can focus on acquiring the data that's most important for societal needs and scientific questions.

Next chart

Slide 12 (00:15:32.069)

This chart is here primarily from when we release these to give you a reference, but we wanted to show you where Responsive Science Initiative arises and what the actual official programs and projects are in our budget. Those are different than what you hear of as programs and projects in our normal day to day use. You see on the right, highlighted in yellow, the Responsive Science Initiatives with those different areas I just outlined. In kind of a simple color are some of the things that were realigned at this program level. Most things were realigned at smaller levels. They were smaller budget lines scattered throughout our portfolio that can now be managed in an integrated way.

Slide 13 (00:16:11.519)

Next chart. This table has the numbers, I will mention that FY2024 plan is a quick look. We just got that appropriation. It is at about the 2.2 billion level in FY 2024. and then you see this request is a moderate increase to about 2.38 billion dollars next year. So this is sustained and moderately growing support of Earth Science. In this budget environment, that is an extreme, I think set of bipartisan support, both from the House, and the Senate, and the FY2024 appropriation and also from the Administration in the FY2025 President's Budget request.

Here you also see Responsive Science Initiatives, appearing. So, because of that realignment, I would not look at ups and downs in any of the other lines and say, oh, this one's going down or this one's going up because it's really a pretty stable budget with no big changes at those project levels. Next chart.

Slide 14 (00:17:15.959)

This is a balance representation, and this is the first time we've shown this Responsive Science Initiatives as part of that budget. It is distinct from our traditional Applied Sciences research. Which is, although research and applied, very different from these responsive science initiatives that are taking things that last mile through partnership. Next chart.

Slide 16 (00:17:40.049)

So I want to provide just a few more details for those of you who may, or may not, have been tracking specific missions. This budget is supporting Landsat Next. Landsat Next represents a real upgrade and capability targeted to very specific economic needs across the government and global users. And so a couple of things about that. One is a 6 day repeat cycle. So that more frequent repeat cycle is really important for changes in agriculture and other kinds of vegetation changes, drought responses and so forth. It has additional bands and you see that quick representation there on the right and next chart.

Slide 17 (00:18:24.779)

So, for our Decadal missions, which, as I mentioned, we really balanced with the need for Landsat Next to stay on schedule. We are still in place in implementing the 2017 Decadal Survey, including the missions of the Earth System Observatory. All of those observables have a plan, they may not all be a new mission and that plan may be something that we need to keep adjusting but that is what mission formulation is about and so that's what we've got in this budget. You'll see Earth System Explorers and Earth Venture. And when we have needed to do so, we followed some very specific guidance in the Decadal Survey that said, in austere budget environments emphasize competition. And so, you'll see, there are some cases where we did that in order to have cost cap missions that help us to still keep the science, the critical science going forward.

In Venture and Explorer, we established PolSIR. That was an atmospheric science selection from EVI-6. That integrated cadence supports better proposal development pacing over the

budget window. There is a one year delay in EVS-5, but for those of you waiting for EVS-4, I know that question is on many people's minds, the announcement of EVS-4 is imminent. Very, very soon.

Then for the Earth System Observatory we used a strategy that we call decouple, partner and compete. I already mentioned a little bit how decoupling can save money, because you don't have to have everything, get ready to fly all together. You can spend a lot of money on a mission waiting for that last instrument while everybody else, the whole team that's going to implement that, is ready to go, but not able to start the mission.

And so that was one aspect. Another aspect is partnering. Where we could leverage international partner contributions and get a lot of science for relatively small investments we emphasized those partnerships.

And then, finally, when there were situations where it wasn't clear what science we could afford, or what would be the best science, then we looked at the competition approach, which is always a principle that we use at NASA in those situations.

So, what you'll see in this budget is that GRACE-C, formerly Mass Change, has no change from last year. It continues forward for launch in 2029. The thermal instrument is retained as a contribution to partner mission operated by the Italian space agency. That gets us the thermal capability as the successor to ECOSTRESS on the International Space Station, and it's there before Landsat Next flies. So that's also an important continuity protection.

Slide 18 (00:21:13.439)

The SBG VSWIR does have a significant delay in this budget. Now, we will work to see how much we can pull it back, but it is the successor to EMIT as an imaging spectrometer on the International Space Station with about 20 times the coverage. So very important mission advancing our knowledge of surface biology and geology.

AOS-Sky has some significant restructuring because it changes from primarily one large mission with a lot of capability on it to a set of smaller missions. And I'll have a little bit more about that shortly. AOS-Storm, we replaced with a launch of the PMM mission as well as the dual CNES radiometers.

Next chart.

Slide 19 (00:22:03.719)

So, AOS is a little complicated, and it will take some time for the community to process this. I think, as you see this, and as you get more information, you will find that we were able to protect the things that the community was telling us were the most important aspects. So, we essentially went from a tightly coupled architecture to a decoupled architecture. That means from larger integrated missions to smaller missions that fly when they're ready.

The AOS-Sky backscatter lidar is replaced with a new multi-purpose lidar mission. Italy is going to fly that mission. The U.S. will make contributions to it. AOS-Storm, which had precipitation radar and a radiometer is now replaced by the collaborative launch of the precipitation measurement mission, with multi-partner contributions from Japan and France. AOS-Storm backscatter lidar is the one thing that has been removed and so that will be a disappointment to parts of the community.

AOS-Sky, the cloud conviction radar, which we've had so much dialogue with you as a community over the last two years. That is the component that we are expecting to become a competed mission, with final selection of the best science approach that fits the budget. To keep that schedule, we are working very hard to get a community announcement out to you. I won't be able to say a lot about those plans until that community announcement comes out so that we have a good level playing field for everyone. We hope that community announcement will be out early next week and give you the details of what we're thinking about that competition.

And then the directed and partner missions solidifies, sustains and expands our international partnerships in the atmosphere sciences to help us keep the science on track. We are expecting industry procurement of many of these instruments. And that also is important for the overall architecture and structure.

Slide 20 (00:24:16.769)

Now, on the next chart, I'm just going to point this out. So this is one way, you've seen us show this, the Earth System Observatory feel before. We annotated on here where the things are changing, where things are staying the same, as another way of summarizing in a format that you've seen before. These charts will be posted. You can study these in detail, and if we go to the next chart.

Slide 21 (00:24:41.579)

Because the words we're saying about AOS are pretty complicated. We also have a block diagram here. On the left of this gray signpost in the middle, you can see the previous plan with a highly capable AOS-Sky. A lot on one major mission. And then where we are on the right for that polar orbit shows the multipurpose lidar mission from Italy, it's tentative name is CALIGOLA, that name may change. A passive directed mission with the radiometers, polarimeters and far infrared and then the completed mission there. So this is another way of representing those changes and you'll have a chance to take a look at this. The AOS Project Manager and project scientists will be having appropriate forums with the science team members, former science team members and others to continue talking about these changes. There's obviously in a budget that's one set of changes. And then there's a lot of real engineering to be done to get all of those detailed out and we'll go to an appropriate updated engineering milestone as we get those details done. We're trying to do it as fast as we can, while getting it right so that we can keep these missions moving forward. And because the further you are in formulation, the less vulnerable, some of these are, to changes in budgets over time.

And to the next chart, then.

Slide 22 (00:26:11.489)

I wanted to give you a sense of the new Explorers and Venture integrated cadence what that looks like here. And you'll see it's much more evened out where, I didn't put it here, but if I put the chart of what this was starting to look like, with all the different kinds of explorers, each on different cadences, you know, we had Earth Venture Instruments and Earth Venture missions and Earth Venture Continuity, and they were each on different cadences. They would wind up clustering where sometimes you had 3 AOs all in the same year and then you might have a gap with multiple years. And that's not a great way to select missions because you want opportunities for missions to get feedback and re-propose. It's also really hard on proposal development teams, because there's a surge of effort associated with those and so spreading that out over a more. Even time frame is also important to get the best proposals. We could get next chart.

Slide 23 (00:27:05.579)

And here for your reference, once again, when you can download this as the standard flight opportunities chart, that we always show where, when we're engaging with the community, with those new updates included. So that you have a sense of how those are going to flow.

Slide 24(00:27:24.629)

Next chart. So as I start wrapping up my remarks, and we can shift to questions, I do want to emphasize we have amazing success in Earth Science. A high proportion of the missions that NASA flies in a year, are Earth Science missions, and a high proportion of the launches every year, are NASA Earth science missions. And these are the next three. TSIS 2, coming up this year, which is a replacement total solar radiance monitor for continuing our continuous data records on the sun energy input to earth. PREFIRE looking to close our gap in understanding on the heat that's lost to space, the other side of that equation. And NISAR the NASA India Space Research Organisation, Synthetic Aperture Radar mission, still planned for later this year. That, as I said, really addresses the surface deformation and change designated observable. We're going to learn so much about the Earth from this amazing mission.

Slide 25 (00:28:31.769)

Next chart. So I think that I just want to wrap up on one more page.

To just remind us that compared to any other science in the Science Mission Directorate. We have 8 billion stakeholders and growing. People really care about the Earth that they live on, it's our home, it's changing. People are worried about the change in their experience and we have an amazing ability to explain this. And so here are a few images from our new Earth Information Center, which is open in the Headquarters lobby. It's outside security, anyone can walk in. And we're partnering with others, including the Smithsonian, to get NASA data in these kinds of accessible ways into public understanding and that multiple information and exchange. The things we know about the Earth, people listen to us when we talk about that. Making sure that we are of the maximum benefit to the world and the maximum benefit to humanity for all the work that we do. And so, with that, that's the end of the prepared remarks, and we can start taking questions. Who's our moderator?

Slide 26 (00:29:51.299) **Wendy Mihm**

Hi, it's Wendy. I'm back. Thanks, Julie. So we've got so many questions in the Q and A area so we're going try to get to as many of them as we can. The first one is about continuity measurements. The question is, and I think this is going to go to Julie and potentially Antonios and/or Jack.

Q "How will continuity measurements be addressed with the restructuring of EV?"

A (00:30:20.529) **Julie Robinson**

Why don't I go ahead and take that just since I'm not sure Antonios came on. So, let me just say that our approach to continuity, It's something we think about dramatically and everything we do. And so we don't need a designated EV that's only occasionally to protect that. As you can see, even in looking at AOS, we thought about continuity. So we'll continue to treat that as a programmatic consideration. What we also expect in our Venture is if we know we have a gap coming, we will definitely put it in the community announcements. So the community has the maximum notification that there may be certain areas that are of programmatic focus. So we can do that within Earth Venture without having designated sub lines that kind of tie our hands. And that way, we can bring continuity forward at the right points in time where it makes sense.

(00:31:22.393) **Wendy Mihm**

All right, thank you. And we'll get to the next one. To go back to the top of the queue here. So, the question is, I believe for Jack and or Julie, the question is:

Q: "If budget funding, the budget is increasing. Why are ROSES funds stagnant?"

(00:31:42.199) **Julie Robinson**

A: I'll say a couple of words, and then let Jack add on. So our budgets are increasing, but they're not increasing a lot. They're sort of tracking inflation. So, we have challenges when we have a Decadal with ambitious and important goals, to get those to Decadal missions into that budget. You can see, we don't get a big bump to accommodate that. So, on the one hand, those are increasing. When it comes to the research part of our portfolio we do have to balance between increasing each award, is one thing we can do with this small amount of growth that we have. Or we can have more awards. Or we can create new areas, both interdisciplinary and accommodating new disciplines, which have been developing over time. So those are the things we have to balance, and we look at each program, item by item and the adequacy of the proposals that are coming in, whether we think they can accomplish those goals. So, let me let Jack add a little more about that.

(00:32:45.989) **Jack Kaye**

Yeah, so we tend to rely on the disciplines in R&A as a core thing that that stays stable, and we try to minimize fluctuations. We have added a lot of solicitations in recent years as post launch, competed science teams for the newly launch missions. So if you go back a number of times, going back to SMAP and ECOSTRESS and GEDI, and all of these things that we've had new post launch completed science teams for that exist on top of the things that we already have. And when we've had some flexibility, we've also introduced some new kinds of things like, a couple of years ago we did the Science for building coastal resilience, which really integrated across multiple programs: Physical and Biological Oceanography as well as Earth Surface and Interior. And we did Subseasonal to Seasonal Hydrometeorology, which really brought the Weather, Climate and Hydrology Programs together. So, in some cases, where you see flat in the some of the underlying disciplines then, we do have new things that come along. Also one of the things that we will try to do sometimes, is that, we tried to say for the programs that do field work we tried to handle some of the MPCs separately. So the solicitation now that affects, some of the money that we will apply to the missions. So, you know, there's augmentations to that enhance the ability. So that what you see completed, may not have to pay for some other things that are needed to actually implement the things that we are competing.

Julie Robinson

Thanks. And that was our associate director for research and analysis.

(00:34:46.711) **Wendy Mihm**

All right, thanks guys. So we have a question that came up about AOS. the question is:

Q: "Julie, so that the community may start preparing to support NASA through a completed mission. Can you provide any guidance on which portion of might be competed?"

Well, Julie addressed that to the extent that she could already in her remarks and we're going to wait till the announcement when it comes out so that everyone can start on a level playing field. So, Julia, unless you want to say more about that, I'll pivot to the next question.

(00:35:13.035) **Julie Robinson**

The process is, the community announcement will be the next level of information. We've given you what I can. But that should be next week so it's not a huge difference.

(00:35:24.831) Wendy Mihm
Excellent. Okay. And then a similar question on SBG:

Q: "Can you describe the approach to decoupling the 2 instruments in SBG? Will they'll be two separate spacecraft/ launches. I believe Julie covered that as well. But I wanted to see if Julia or anyone in the room wanted to add anything further on that.

Julie Robinson

A: No, let me add Wendy. I think before the way we talked about, it always had two separate spacecraft and two separate launches, but people didn't realize that the way we named it. So, it was always a tier instrument contributed, at least ever since it came in at KDP-A, the 1st milestone in formulation. It was always 2 missions. One was an instrument contribution, which is a really cost effective way to get an observation and leverages NASA's capabilities in thermal imagers as well. And then the, the VSWIR mission was always the independent directed NASA mission. So, the difference now is, instead of trying to rush the VSWIR mission so it launches with the Italian mission, now, we've decoupled them. They could go a little bit later. They'll still overlap and we can continue working with our Italian colleagues to optimize that as best we can. But that's very different than having to fund an acceleration to try and keep with the launch of a partner mission, which costs money, and this was a way of balancing that trying to get all the best science while not compromising science measurements where we could make programmatic adjustments that help that fit the budget profile.

(00:37:03.648) **Wendy Mihm**

All right, thanks, Julie, next, we got a pair of questions for Tom Wagner. He's the new head of our new Earth Action element.

Q: "Could you please discuss what's meant by the word responsive within the new Responsive Space Initiative when it comes to the purchase and use of commercial imagery? And then part 2 of that question. Can you also share more about who's leading the new Responsive Science Initiative programs? Does that sit under you in Earth Action? Or where does that?"

(00:37:31.534) **Tom Wagner**

A: So, Responsive Science is under Earth Action along with Applied Sciences. The line was created and the name responsive is supposed to reflect the idea that a lot of what's in that element responds to user needs. But also in that element are things where there are some commonalities in the management approach, the way that we actually manage them as a project. And then the third one, with why is CSDA under there is because what we're trying to do with CSDA is purchase data from the private sector that meets NASA's need in Science and Applied Sciences.

(00:38:15.111) **Wendy Mihm**

All right. Thanks, Tom. Okay, what is next on our list of questions? OK Here's the next one.

Q: "Do changes in EV mean EV-M is going away?"

(00:38:30.115) **Julie Robinson**

A: So, I'll take that. What's happening with EV is it's just becoming all EV. And that means that a mission can probably be proposed every time. If we think we can't afford a mission we'll let you know. That instruments could be proposed most of the time. If we think we need to give some other programmatic direction, we'll provide that in the community announcement. So, it actually means, if you have a favorite flavor of EV, that was the one you like to propose to, it gives you

more opportunities to propose and let those missions come in. It also gives us more ability to adjust and make sure that we're matching the budgets and the opportunities as we go along.

(00:39:14.408) **Wendy Mihm**

All right, thanks, Julie, and I'm going to tag on another since we're on a EV theme

Q: "So regarding the EV program, the regular cadence makes a lot of sense to avoid clustering. Can you commit to a community announcement timeframe ahead of each EV? We would request 18 months. The key things that we need to know are: What observable will you solicit and what the cap will be. Investment, as you know, starts many years before an AO, and if we don't know these things, all the responding organizations may not optimized use of their resources.

(00:39:49.575) **Julie Robinson**

A: Yeah, thanks for that. And we understand those challenges and developing proposals. We can't commit to 18 months because, as you may have noticed Congress doesn't give us budgets 18 months out. So we tend to try to be sure we're going to have the budget for the solicitation before we start people working on it, but we do recognize the earlier the better. So we really try to have at least 12 months in that cycle. If we can do longer based on the timing of things, we will. We'll let you know what we know, as soon as we can.

(00:40:25.212) **Wendy Mihm**

Okay, I'm going to stay with an AOS theme.

Q: "What is the decision for the passive instruments on AOS-Sky given radar will be AO?" and the 2nd, part of that question is, "Will there still be industry procurements of AOS spacecraft?" And there's a 3rd part "Is there a plan for the AOS polarimeter?"

We'll get this one to Julie to start and I'll repeat it again. "What's the decision for the passive instruments on AOS-sky? Given radar will be AO?"

(00:40:52.873) **Julie Robinson**

A: Yeah, so the thing that we're starting with is the AOS architecture that was brought forward at KDP-A, plus the trades that were KDP-A assignments. So, as you may know there were 3 open trades there, where we weren't sure that the architecture that was brought forward at Mission concept review, we could afford it even then. That's before the budget of today. That was the radar capability, and the two lidar capabilities, the backscatter lidar in inclined orbit, and the lidar that was planned for polar orbit. So everything else, we're assuming and directing our Goddard Project office to go analyze and see if we can get that in the budget profiles that we have. There'll be a lot of forward work and then we'll come forward to a Delta decision point and baseline a new architecture. That's the approach we're using.

(00:42:07.488) **Wendy Mihm**

Okay, we're going to stay on that theme for a while. Quite a few questions on that.

Q: "Will there still be industry procurements of AOS spacecraft. And is there a plan for the AOS polarimeter?"

(00:42:07.488) **Julie Robinson**

A: So, the polarimeters, we're still working to the baseline plan and then if we discover we have to do a descope or something else. It's not really a descope as we are in formulation. Right? It's a right sizing. We'll have to approach that, but for right now we're carrying the same polarimeter concepts forward. You said I think something else?

(00:42:28.771) **Wendy Mihm**

Q: "Yeah, there's just sort of a broader picture. Would there be industry procurements of spacecrafts?"

(00:42:35.592) **Julie Robinson**

A: That is not something we can comment on at this point in time. We've got to get our architecture right first, and then update our acquisition strategy.

(00:42:45.847) **Wendy Mihm**

All right, we're going to keep you on the hot seat for now with more AOS questions.

Q: "What about the CSA partnership? Where does that come into play?"

(00:42:53.054) **Julie Robinson**

A: The CSA partnership is sustained and continued as part of the forward plan. And that's for both the TICFIRE instrument contribution, which is far infrared Imager as well as for the colaunch of the HAWCsat, the polarimeter.

(00:43:12.447) **Wendy Mihm**

Okay, and then another AOS question. Keeping my boss on the hot seat seems dicey.

Q: "How does AOS-Sky differ from INCUS?"

(00:43:22.633) **Julie Robinson**

A: So, INCUS is an Earth Venture. It's a high-risk part of the portfolio where we learn about measurements. AOS-Sky is a major observable and Decadal survey. So we approach risk very differently in that. We will absolutely learn from INCUS, things that we fold into our AOS development. But they're, they're at a different points in time and a different approach. And that's part of what makes our NASA mission so agile. That's why we keep advancing the front end our science. Because we do that we use Earth Venture to learn. And then we can make bigger mission investments on the parts that we have documented and shown are really important data.

(00:44:05.850) **Wendy Mihm**

All right, thanks and then one final part of that AOS and then Kate tells me we have a question in the room. So this last part also about AOS.

Q: "Important science in AOS-Sky was to come from the synergistic observation by a polarimeter and lidar. What steps are being taken to ensure this continues if these components are decoupled?"

(00:44:25.192) **Julie Robinson**

A: So, just because we're decoupling them doesn't mean we're not co-flying them. You all know the great example of that was the A train, becoming the Earth Observing System. So we can and do get multiple missions in orbit that then overlap for enough time to accomplish those. One way you do that is by really thinking about integration of your products while you're doing mission development and that's an important part of making this decoupled approach successful. So, just because we decoupled the missions doesn't mean we decoupled the science and those integrated approaches to science across multiple missions will be an important part.

(00:45:06.088) **Wendy Mihm**

Okay, so thank you. I hear there's a question in the room, so I'm going to pivot to Kate Becker. Kate, you can handle that one and then pass back to me.

00:45:15.450

Q: "This is also AOS related. It's this idea of decoupling the different missions. Is that going to have an effect on the longevity of the missions and the science they can impact. Because, small sat doesn't last as long big sat."

(00:45:38.160) **Julie Robinson**

A: Right. So, we've got to work on that. Our goal is to have as much overlap as we can and we'll be able to make adjustments between different missions. As you well know, when you actually get to development and start building the mission a lot of times your schedule isn't what you imagined anyway.

So, you know, our hope is to keep these things progressing forward in approximate synchrony and to have significant overlap in those sessions. And we'll make decisions along the way that makes sense to help ensure that where we can. But there may be some missions that fly a year before the companion mission goes and then we have to wait a little bit get everything checked out and going. Then when the second mission flies, then we get those synergistic data products.

(00:46:23.811) **Wendy Mihm**

All right, so we're going to go back to the questions in the Q&A section. The next one is:

Q: "Will the strategy partner apply to missions be applied more in research areas?" and that question is for Tom first, and then he's going to hand off to Jack.

(00:46:40.188) **Tom Wagner**

A: Right. So, for people who don't know, for the missions, right generally, we assign something called the PAL, program applications lead, or the unfortunately named MAL, missions applications lead. You know, that's a little bit of a legacy of the past. Right? One of the things we're recognizing now is that we are really cross-cutting, You may not have seen it, but we have a new org chart where we even identify some staff in R&A and Earth Action as being cross cutting. And every day we recognize that there's a lot of things going on in both of our programs. Some of things in Applied or Earth Action that are research-y. Some of the things in R&A that are really Applied or Earth Action-type things, and we have a lot of dual hatted people. Jack and I talk all the time. We're talking about there's going to be some sort of joint solicitations and things coming out. So, it's a different approach than what we do to the missions. I'll also say that, all of the staff have now in their plans, they actually have to have an Earth Action element about supporting this strategy and with that I'll kick it over to Jack if he wants to add anything.

Jack Kaye

No, I think just to reiterate the fact that there's, I think, increased recognition and a fair degree of excitement. We know that the science that we do is excellent and we're learning new things about the Earth. But the idea is that we all want that to be useful as well and useful in an optimal way. That's not new but I think this increased recognition that bridging where there has been a gap, that is part of everybody's responsibility. So there is a lot more interaction, the science is driving us in that direction, the capability that we are bringing online is driving us in that direction, whether it is satellites, airborne, modelling, It all drives us towards more time together, trying to figure out how to capture the benefits that we can mutually enable.

(00:49:00.815) **Wendy Mihm**

All right, thanks, Jack and Tom, we're going to keep Tom on the hot seat for just a second, with possibly an assist from Julie. The next question is:

Q: "Will representative science include flight missions? If so which program office will manage them?"

(00:49:15.168) **Tom Wagner**

A: Yeah, so we talking about the Responsive Science Initiative. No, that's not planned to include flight missions, right now. It's really targeted at looking at what do users need in other agencies? What our users need across the board and how do we deliver that kind of work? There will be some form of a research element under there. You know, if everybody saw the pyramid and the big arrow on the pyramid, we're interested in figuring out what users need and feeding that into the bottom level of everything we do from basic research, Earth Systems research through technology and missions and things like that. So Responsive Science is going to be really targeted on that work of meeting users' needs and getting their feedback into the system. Did you want to add anything?

Julie Robinson

Yeah, I want to add a philosophical note about the way that we're going to do Science teams. Because Tom mentioned that, but it, it can sometimes be hard to get your head around what could be changing in science teams. And if you look at the PACE mission and the NISAR mission. Both of those had science and applications rolled into the Science teams from the very beginning. Both missions did a lot innovative things in consulting with users and understanding user needs even as we built the science requirements. So that model is something we see going forward. It has been part of the Earth System Observatory pre-formulation. It's still part of that thinking. Our expectation is, you don't have separate pieces of Earth Science, all putting someone on a mission team. You actually integrate and have our whole community and including all of you, think about the whole spread between science discoveries, all the way to the most important and impactful information. And make sure we're building that into our missions.

(00:51:01.612) **Wendy Mihm**

All right thanks guys and I understand from Kate that there is another question in the room. That will probably be our last question of the day because word on the street is that Nikki Fox, our SMD lead, has also joined and she may want to make some remarks at the end. So, Kate to, you.

(00:51:19.547)

Q: "Alright, so I'm going to ask you a question about GEOCarb and now my understanding is that you shouldn't have to rebuild. So will NASA consider any launch to make some use of that instrument?"

(00:51:33.210) **Julie Robinson**

A: Yes, as you know, GEOCarb is a real challenge because assembling an instrument is different than having a flyable instrument. And so, now that that has been delivered, we have engineers working on understanding how far it got with the budget that NASA had available until cancellation. Once we get that assessment, then we'll start thinking through what the next options would be.

(00:52:07.001) **Wendy Mihm**

Okay, if that is it for now, I wanted to just open it up to Nikki and put the spotlight on you very quickly to see if you wanted to make any remarks to the Earth Science community before we wrap.

(00:52:20.487) **Nicola Fox**

Hey, thanks so much I didn't mean to take up precious question time. I know how important it is, and it's great to see so many people signed in to listen into the town hall. I did manage to hear most of the end of it. So, lots and lots of questions on ASO we'll certainly take that back and make sure that we keep the messaging about that very clear. I just want to say how tremendous it is to see everything that we're doing in Earth Science. I'm really excited about the PACE mission. I might have seen a sneak peek at some of the data. And, well, I can tell you is, when you see that you will be mind blown at just the stunning views of our planet. And I can't wait to see all the amazing science that we're going to do with that mission.

And also, of course, really looking forward to NISAR launching later this year. Doing just incredible, incredible science. I actually had the privilege of going out to India last week and meeting the team who are doing incredible work out there. With the JPL team, the NASA team, and the ISRO team working so closely together. So it's going to be really, really exciting to have that. And, of course, you know, all of our more than 25 science spacecraft that are producing that super, super critical data and getting it into the hands of our decision makers. I'm off in a little bit down to the Earth Information Center here at NASA headquarters to do to do an interview and talk more. That's probably going to be more about the sun. But, you know, the sun and the Earth have a very profound relationship. So I'll be sure to give some love to my Earthling Colleagues as well. As always please share our message wide. What we do with NASA science, what we do in NASA Earth is so important. And it's critical to keep up the support as we want to do more and more and more amazing things. So, thanks so much for letting me crash the end of your town hall.

(00:54:22.515) **Julie Robinson**

Thanks Nicky and thanks so much for your leadership of science and your incredible support of our science. We really appreciate it.

(00:54:29.065) **Wendy Mihm**

Yes, and thank you for letting us put you on the spot with absolutely no warning whatsoever. Let me just pivot to Julie. Julie did you want to make any closing remarks before I just head out with some final housekeeping.

(00:54:42.669) **Julie Robinson**

Yeah, sure, just to wrap up. This is an incredibly challenging time in our nation in terms of budgets, but we also have bipartisan agreement and we also have support of Earth Science and you can see that in this budget. So, we think big and we should think big. Sometimes we have to scale those to fit in resources or scale those to fit in time. But I think we have such a robust community here listening today. The people who are working these missions have so much ingenuity in helping us solve these problems. Even in situations like this, where we have work to do to redefine and confirm a change in an architecture, for example, with AOS. We have incredible ability to come together strong.

And the impact of what we do as a community is affecting every single person on the planet in some way. And that is just an amazing mission. It's one, I'm so proud to share with all of you. We can always work through these challenges, if we pull together as a community and we think about the interconnectedness of our disciplines in the same way we think about the interconnectedness of the Earth as a system. So thanks everyone.

(00:56:01.108) **Wendy Mihm**

Thank you Julie. And just one last housekeeping thing. Thank you so much for participating. Stay tuned to the Community Forum website. That's where we'll post the slides and, as I mentioned at the very beginning of this program, we have a much longer slide deck. There's so much work that we're proud of, that we wish we could have shown and talked about today. So there'll be a longer slide deck and you'll see that additional content after the end card slide, which you see here. So stay tuned for that. That's our goal is to get that out within the next week to two weeks. And we thank you for your attendance today by everyone.