

Earth Science Division Community Forum

October 22, 2024

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Wendy Mihm: Hello everyone I am Wendy Mihm, I'm the Earth Science Division comms lead. I'll be serving as your MC today. Those of you who are joining us again are used to these and might remember that our last community forum was back in May, and at that one we focused on the launch of the Earth Science to Action Strategy. And since then, we've received the National Academy's Midterm review. This is an assessment of NASA's progress towards implementing the 2017 Earth Science and Applications from Space Decadal Survey. So, in English, we received our assessment from NASEM on the midterm. Alright, today we're going to spend our time sharing our response to that assessment and we will also express our gratitude to the Academy, for the time and thought that they put into that assessment. Our main speaker for today will be ESD Division Director, Dr. Karen St. Germain, and she's going to talk us through that response. We have saved, what we hope is a fair amount of time at the end, for questions and our wider ESD leadership will be on hand as well to help answer some of those. But first, let's do our usual bit of housekeeping. So let's flip to the next slide, please.

Slide 2: 00:01:14.430

Okay, so closed captioning is available. If you look down in the left-hand corner of your screen, you'll see what looks like a little quote bubble, and it says CC. Just click on that and you will be able to access that feature. Now, for this Community Forum, if you have questions, the chat feature has been disabled for security reasons, so we are only taking questions in the Q and A function. The way you find that is, you look at the bottom right hand of your screen and there's a little oval shape that says Q and A on that. You click on that and type your question in. That will come to the panelists and we will try to get to that as quickly as we can during the Q and A session at the end. And just a reminder, this meeting is being recorded. After we're done here, that recording, as well as the slide deck that you're going to see, as well as the full transcript of today's Forum will be made available as usual on the ESD Community Forum webpage. And if you had your eyes on that space today, you may have also seen that that's the same page where you can find, the full Decadal Assessment and NASA's formal response to that assessment. So, without any further delay, let me hand it over to Dr. Karen St. Germain. Thanks.

00:02:38.609

Karen St. Germain: Thanks so much, Wendy, and thanks to everyone who's joining us today. I am joining you, actually, from Montreal, Canada where I, along with several members of the leadership team, am meeting with our fellow space agency leads at the annual CEOS plenary meeting. As all of us are caught up in the day-to-day details of our jobs, it is really a delight, actually, to be at a meeting like CEOS where we look across, a lot of the waterfront of the great work that the community is doing, in advancing the science and in making that science usable and used, by communities around the world. So, coming to you from Montreal and looking forward to the conversation, let's go ahead to the next slide.

Slide 3: 00:03:50.750

So this how we've structured the discussion today. Wendy mentioned that the full assessment of the Midterm committee and our point-by-point response is available online. We're not going to do a point-by-point response today. We wanted to construct the conversation around the themes that we heard in the Midterm. If you want the specifics, the full written response is the place to get those. But really what we're looking to do today is engage in a conversation with the community. So I'll start with just a little bit of background and context, and then we'll go into the Midterm response organized around three thematic areas. One is our engagement. The other is moving forward with the Decadal missions or the Earth System Observatory even in the face of budget constraints. And the third topic is, a couple of strategic areas that are extraordinarily important to us; namely sustained observations or continuity and modeling. And then we'll wrap up with some concluding thoughts and upcoming events. We'll hopefully have plenty of time for any questions. So, let's go ahead to the next slide.

Slide 4: 00:05:23.909

All right, what we're all here to talk about is the Midterm Assessment associated with NASA's response to the Decadal Survey. As you know, the Decadal Survey covers not just NASA, but NOAA and the USGS as well. What you're going to hear today is just the NASA response. The Decadal is a very ambitious and comprehensive set of scientific guidance and guidance on observables and how we do our work, including across agencies. At a high level, our priorities were to execute on the program of record. In other words, deliver on our commitments. To advance not just the program of record, but all of our flight missions, our research applications and technology, to implement the next generation of observables and that was intended to cover both the Designated Observables and the new Explorer observables. There was also clear direction in the Decadal that we should be working hard to maximize the science certainly and always, but also the societal benefit of the science. And so there was a pretty ambitious call for us to advance in, in both of those areas as well. So that's again at an extraordinarily high level. Let's go to the next slide.

Slide 5: 00:07:21.089

As Wendy mentioned, at the last Community Forum, we talked about the Earth Science to Action strategy. It rolled out earlier this year, and we've been working hard all summer long, in between that Community Forum and this one, to breathe life into this strategy. We think the strategy is responsive to the full breadth of the recommendations that came out of the Decadal Survey.

Of course, it starts at the foundation with the missions. The missions are, in many ways, the skeleton upon which everything else gets built. When I say missions I'm using that word a little bit broadly, because that includes the technology investments that enable those missions, the observations that are collected by those missions and the reprocessing that happens over time to ensure that we have a very, very strong foundation of observations that are well understood. From our satellite platforms, also our

airborne and ground-based networks, we have that incredible foundation of observation upon which everything else builds.

The next tier up is the science tier that is really discovery, science, and applied research. This is about growing our understanding, and this is in many ways the beating heart of the whole enterprise. This is where that discovery takes place and where the discovery of new ways to use our understanding takes place.

Building upon that, of course, our applications-driven models, and engaging with users of the data beyond our immediate community to inform decision makers, support the various services that the government provides often in partnership with other agencies, and so forth.

Building upon that, we can really advance the public understanding of the science and the many many ways that science affects their lives. It affects the economy, their jobs, their security, and so forth. And then of course there's the virtuous cycle, which is this big arrow coming back around, broadly representative of feedback throughout this process. It is often as we are doing the science, as we are trying to use the science, that we learn about things that we need that we haven't done before or things that we haven't gotten quite right. That big arrow is intended to certainly represent feedback from the top part of the pyramid, the use of science back down to inform our missions and our fundamental research, but also recognizing that there are many feedback loops at all levels throughout this strategy. So this is this is just a quick walkthrough overall of the Earth Science strategy in response to the Decadal. Let's go ahead to the next slide.

Slide 6: 00:11:26.549

A big part of what we all focus on with the Decadal Survey is the observable recommendations. As you will all recognize on this slide, these were the Designated Observables as identified in the Decadal Survey. When we looked at this and saw the full breadth of what the Decadal was suggesting that we realized that this was really an Earth System Observatory taken together. So that's how we thought about this set of recommendations. And if you go to the next slide, you'll see how those Designated Observables mapped into missions that we are working on.

Slide 7: 00:12:25.039

In the upper right, the Clouds Convection and Precipitation and Aerosols observables are intended to be met through the collection of PMM and the Atmosphere Observing System with three components there: Sky, Storm and Cloud. Mass Change, down in the lower right, is intended to be achieved through the Grace-C mission. In the lower left, Surface Deformation and Change. There in recognition that NISAR mission had not yet launched, we formally decided that we would rely on NISAR in the near term to advance the observations of Surface Deformation and Change. We would learn from NISAR before we move forward to what comes after that. And then in the middle on the left is the Surface Biology and Geology mission. There are two components there, the thermal infra-red and the VSWIR missions.

So, these are all missions that are in formulation and in the case of Mass Change moving into development and I think on the next slide, we have more specifics about the stage.

Slide 8: 00:13:48.469

Oh, no, I guess that's maybe later on. So those were the missions that we were developing in response. Of course, we also have the Explorers program. Alright, so now with that little bit of background to level set, let's move right into the Midterm response highlights.

Slide 9: 00:14:07.049

The first thematic area was around engagement, and maybe on this slide we should have said engaging our community and our stakeholders, because we try to cover both of those in this section. Let's go ahead to the next slide.

Slide 10: 00:14:34.499

So broadly speaking, what we heard in the Midterm was that we should put a substantial effort into articulating the societal value and urgency of implementing the Decadal. There were findings and recommendations around taking full advantage of the CESAS meetings to seek feedback, including on questions of program balance and those kinds of decisions. We also heard that the community would like more communication around the decisions when they're made, especially those that are driven by budget pressure. So, increasing the types and the amount of communication with the community around the decisions we've made and why. And then the fourth one there is, engaging the broader science constituency or enterprise along with our partners, NOAA and USGS in preparation for the next Decadal. There were some specific thoughts on that. We bundled these together as they were, they were all specific findings, but in this thematic area of engaging our community and stakeholders. So, let's go ahead to the next slide.

Slide 11: 00:16:29.809

So, articulating the value. First let me say that we could not agree more with the value of the work we do and the importance of telling those stories and expressing that value and the urgency. Here is a short list of some of the things that we're doing. One very, very recent thing is the opening of the Earth Information Center, that expansion into a beautiful exhibit in the Smithsonian Natural History museum. You see that picture in the lower right? That's allowing us to tell stories about the importance of Earth observations and the science that we do based on Earth observation and the real differences it can make around the world. It's intended to be a place of hope and inspiration.

We've also been doing a tremendous number of Congressional visits. These can be to committees or very often committee staff. The committee staff are often willing to take the time to sit down with us and really learn about the priorities. We have also been hosting or co-hosting Hill briefings and events. These are things like lunch and learn events that are open to, not just the staff from our committees, but from across the House and Senate. Events where we bring in, or create the venue where others can come in and talk about the value of the work we do. The most recent one of those was really focused on

agriculture and we had a substantial number of people in the agriculture economy come in and talk with staff and members of Congress about how important they think NASA's work is.

We've also done agriculture road shows where we're going out into the community, out into the field. Meeting with users who make use of our data, our observations are applications and so forth and really learning more about what questions they have that we can't yet answer. You might think that that is really just about informing applications development. In fact, some of those conversations have led us to asking fundamental research questions. So, it's a full spectrum of feedback we get when we go out into the community. We also hosted the early adopters showcase, which was an extraordinary event, and we, invited people from the Administration and the Hill to attend that. And then, and then more broadly, we're working with people who are influential in their communities, to ensure that they have the information they may need to speak about the value of what we do.

So that's not a comprehensive list, but we're trying to give you a sense of the sorts of things that we're doing. I have a meeting coming up with the Western Governors Association, for example. So we're looking to engage stakeholders at multiple levels. And frankly, let me just say in this forum, we're really open to ideas. If folks in the community have additional ideas on how we or the community itself, could, expand the efforts to articulate the value and the urgency of what we do, we'd really love to hear them and we'd really love to know that the community itself is talking and sharing ideas on how you can use your voices to articulate the value and the urgency of what we do. So really open for exchange there. Alright, let's go ahead to the next slide.

Slide 12: 00:21:11.339

That last slide was really about events where we are projecting, or trying to increase understanding of what we do and, and the urgency and the importance. This slide I really want to talk about two-way communication with our community because in the Decadal we heard that the community wanted more two-way communication. So, so we've broken this apart in two pieces.

One, we will have more frequent updates that are targeting the community itself. So, not external stakeholders, but the community itself. So increasing NASA-hosted engagements like this one. One example is that we're already planning for a Community Forum right around the ROSES release to talk to the community about what is in the ROSES call and what we're hoping to accomplish. Many of you may know, we initiated the ESD Director Postcard, so that's an electronic postcard from me. You can sign up for that using the QR code over on the right. And we use that to convey more information about what's going on, what engagements we're involved in at the moment, what issues we're tackling and so forth. We'll continue to work on ways to make that a substantive source of information on a very regular basis. That's a monthly postcard, so that can be, a good way to get information out on a more rapid cadence.

Now the second and longer section here is really about how do we facilitate more information exchange. And one of the big ones, and we've been working since we got the recommendation from the Midterm committee is how to increase our discussion time at CESAS. As many of you know, if you've tuned in before, the CSAS meetings are often a series of presentations, or at least the public session is often a series of presentations, which are always really terrific, by the way. They're always really informative and substantive. But what we heard from the Midterm committee is, we probably aren't spending quite

enough time engaging with and getting input from the committee, as leaders in the community. Now we have to be careful here because CESAS exists under FACA rules, which means the committee can't give us consensus position or consensus advice unless we specifically charter a study to do so. In the context of, for example, our regular meetings, they can't give us consensus advice, but we certainly can spend more time in discussion, so we get the benefit of their perspectives and their input from the community.

Next one on the list there is, we are in the process of planning events now to get additional community input on the Earth Science to Action strategy implementation. If you've read the strategy, you can see that it is very much a strategic document. It is not an implementation plan. It doesn't call out program by program or anything like that. So, we, we are really looking forward to engaging more with the community on how we may approach the implementation. Things like how we would track our progress, that sort of thing. We did over the last two years hold ESO industry days and we got really great feedback on those events. Again, those are events where we're conveying a lot of information, but there's also a lot of time for question and answer and discussion of ways of achieving our objectives and that can be new programmatic models, it can be new technologies et cetera. So, we're going to continue to have those industry days and those are typically a combination of virtual and in person at NASA headquarters.

Another thing that we're going to be moving forward on is establishing competed, integrated ESO science teams. This is separate from the mission science teams, and the idea there is to prioritize cross-mission science and applications. As you all know, we called the collection of missions the Earth System Observatory because we saw the power in advancing the use of observations and science not just in specific discipline areas but also in the science questions we can go after if we have information from all of those missions. So we'll be creating these integrated teams, and of course, increasing the ways and the means that we gather input from end users of ESO data.

I do want to call out though there is an important line right at the bottom of this slide which is we really appreciate the, the Midterm committee calling out the need for two-way communication with the community, but we also ask that you understand that there are significant chunks of time when we are developing budgets or responding to appropriations where the information is embargoed within the Executive branch, and in those times we can't come out and have discussion with the community on priorities. So we'd rely very, very heavily on the Decadal decision rules to guide our decisions. That's an important thing for the community to understand, that we use the Decadal even years after we do the initial formulation to help us think through decisions we have to make when we can't engage directly.

Okay, so, again, this slide isn't intended to be fully comprehensive, but these are the kinds of things that we're thinking about. If there are other thoughts from the community, we are very open to hearing them. There'll be more discussion on all of this at the next CESAS meeting and I think we'll mention that again at the end. Let's go head to the next slide.

Slide 13: 00:29:01.699

Now we're moving on to the next thematic area. This was developing the ESO or the Decadal missions through budget constraints. So let's go ahead, go to the next slide.

Slide 14: 00:29:22.009

Okay, this is a roll up of the kinds of things we heard in the Midterm, that spoke to each of the mission. We got strong recommendation to proceed with the SBG TIR on the current schedule and work as hard as we can to maximize the overlap with the SBG VSWIR, but also recognizing that we need to constrain the costs. The recommendation was to do that to the extent possible within cost. On AOS, they recommended (this is very much a paraphrase) simplifying their requirements and competing parts of AOS. And I'm sorry I should have mentioned in these slides where we're paraphrasing what we heard, we're giving you the page numbers where you can find the full recommendation that we're referring to there. So in cases where our wording of the paraphrase isn't exactly right or isn't fully representative of everything the midterm said, my apologies. We also got recommendation to implement GRACE-C on the current timeline, which is aggressive there, but they also recommended identifying a long-term continuity solution for the Mass Change observable. There was also a recommendation to engage the Copernicus program to explore potential collaborations to meet the future SDC objectives. And, to do a re-evaluation after the NISAR launch, but of course what we really mean there is, once we see what we can do with NISAR. That would be a time to reevaluate what remains unmet and explore collaboration to meet those needs. There was a general frustration that we aren't further along in these missions. There was language about remaining in study phase. So on the next slide, we wanted to make sure we level set everybody on exactly where we are on all of these Decadal missions.

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So the GRACE-C mission, which was formerly the Mass Change mission, is in the FY 25 President's budget. This is the most recent public information. There's no change. We're still targeting a launch by 2029. The SBG missions, for the TIR we are building the instrument and we'll launch it in partnership with the Italian space agency, and that is intended for launch in 2028. In the FY President's budget, the VSWIR was delayed. There is, we recognize, a substantial gap. This comes about because we can't slow down the TIR, and keep the partnership in place, the partner launch, satellite and launch opportunity. To fit within the top line of the available budget, we had to stretch out the VSWIR. The alternative would be that we delay the TIR and have it wait for the VSWIR, but then we lose the partner and then we need more money to do that. So we still are working within multiple constraints there.

And then in the Fiscal Year 2025 President's budget, we did a significant work on AOS. So the AOS-Sky was restructured, into a mix of competed and directed missions, with decoupled schedules for launch at the end of this decade. The AOS-Cloud, what we've now named the Cloud component, which would be essentially the cloud radar component will be competed. And I think, at some point in this package if we don't have it, we meant to have it, there was a community announcement announcing that the AO would be upcoming. The AOS-Storm was reconfigured. We are still supporting the precipitation measurement mission, that's a continuity mission and the co-launch of a second CNES built radiometer on a Goddard integrated platform. Again, that's still targeting a 2029 launch.

As we discussed a few moments ago, SDC. We formally made the decision that we're not moving into formulation now, as NISAR will be addressing needs in that observation space. We'll still be learning from NISAR as we're rolling into the next Decadal frankly. That said, many of you may know that we had to do some work on the NISAR reflector because of thermal issues. We're thrilled to say that that is now

shipped back to India and we're, once again moving forward with re-integration toward the launch of NISAR. So we're excited about that. We will be working with the Indian Space Agency, ISRO, on a new launch date for NISAR. That will be in the new year but early in the new year, we hope.

Then looking forward, we initiated in October a ROSE-L SDC study, so we have that work and we're leading a NISAR lessons learned study as well. We are laying the groundwork for whatever will come after NISAR. So that's really where we are. So, let's go ahead to the next slide.

Slide 16: 00:36:18.749 -

Here we are with the development milestones. AOS went through a KDP-A in January of 2023, and over on the right, the AOS-Cloud community announcement was released in April. You have the link there if you would like more information on that. Surface Biology and Geology went through KDP-A in 2022, and the TIR mission went through KDP-B in July. GRACE-C did go through its KDP-C, so that is a confirmed mission.

If you are interested in learning more about why and how we reshaped these missions the way we did, you can read the Independent Review Board report and the NASA response they're posted in nasa.gov/reports. That is where you'll find more of the thinking about why these adjustments were made since the original architecture work. Alright, let's go ahead to the next slide.

Slide 17: 00:37:35.329

Explorers. So, we are also advancing on the competition for the Explorers mission. You'll recall that the Decadal wanted us to move out smartly on several of the seven observables. We made selections on this announcement of opportunity for step one, which is to say the phase A development. We selected four missions for step one, those are CARBON-I, ODYSEA, EDGE, and STRIVE. And of course, EDGE is responding to more than one of these explorers. So that's why you see it listed twice there. All of those missions are in step one, and we are planning in the next year to down select up to two to move into full development. So we are moving forward on the Explorer missions. We have that program office set up and those are, are moving forward and we're really excited about the possibilities of all of these missions. Alright, let's go ahead to the next slide. Ok,

Slide 18: 00:39:25.980

I think I will not dwell too much here, but these are the descriptions of Earth System Explorer step one selections. You see the PIs listed there and the key observables. ODYSEA is an ocean's mission, ocean surface winds and currents. EDGE is a 3-D ecosystem structure and ICE elevation, a lidar mission. STRIVE is an interesting mission to observe the stratosphere and troposphere. There was a lot of, concern about once Aqua, Terra and Aura are retired that we would be losing some insight into what's happening in the upper atmosphere. This is a different technology, a new technology proposed to measure ozone and trace gases in the upper atmosphere. Then CARBON-I over in the lower right is a greenhouse gas

mission. These are all exciting and really promising missions and I will tell you, it's going to be a tough down select. Let's go ahead to the next slide

Slide 19: 00:40:36.660

We're in the 3rd, and last of these thematic areas and these were our strategic approaches to continuity and modeling. Let's go ahead to the next slide.

Slide 20: 00:41:02.640 -

On continuity, what we heard was that the community did not have enough insight into how we are making decisions, and prioritizing future missions, and also that this is a multi-agency challenge. What we're doing today is, we implement continuity using a variety of means. We are achieving sustained observations through our Venture class missions, through our directed missions and through partner missions to achieve continuity across a broad range of observables. We have a team that does an analysis of sustained observations that are coming up that, need attention, and we use that as a means of prioritizing. We also got the impression that maybe folks did not understand that we have a budget line for sustained observations. So we will be communicating more clearly, probably through the CESAS about that budget line and how we're planning to use it. And then, of course, we do recognize that, working with CESAS and our partner agencies, again, particularly NOAA and USGS, we will talk about this as a national challenge. There are also other guidance and thought documents out there that are providing inputs on this. So there's some work to do here. We recognize that, and we will, increase our communication about how we've been thinking about it, how we've been executing and then engage, likely through CESAS, for a more transparent approach going forward. Okay, let's go ahead to the next slide.

Slide 21: 00:43:10.640

Modeling. All right, what we heard on modeling, that we should engage with the community and again this is with NOAA and USGS, to advance modeling parameterizations and predictions, and let's go ahead to the next slide there. And by the way, that recommendation of course traces back to the Decadal.

Slide 22: 00:44:06.440

We've been investing a lot of thought into a path forward on Earth System modeling. I'm really, really thrilled to say that we've just hired a modeling strategy lead, Ivanka Stanjer, and we're thrilled to have Ivanka on the team to help us really drive this forward. We're focusing on integration of many advanced techniques, and you see over on the right, we have modeling investments and capabilities throughout the Earth Science enterprise, the NASA Earth science enterprise. Of course, when many of us think of modeling, we think of the integrated or system modeling that has been supported by our R&A program for years. We also have investments in advanced modeling technologies happening in our ESTO program. We've got foundation AI modeling happening in our ESDS program and modeling that is really tied to

action and use of prediction over in the lower right. So we're looking to tie together this full spectrum of modeling and of course, doing so in partnership with NOAA. Ivanka, we're really thrilled that she has a deep knowledge of the modeling, enterprises that are resident in both NASA's ecosystem and in NOAA's ecosystem. That's going to be a great benefit when it comes to developing this comprehensive strategy. You'll hear more about this through our engagement with the CESAS and the community. Alright, let's go ahead to the next slide.

Slide 23: 00:46:05.730

Okay, so that's the thematic areas that I wanted to walk through with you. Again, you have the full response to the midterm, and let's go ahead to the next slide.

Slide 24: 00:46:27.230

This is the link to the Earth Science to Action strategy. That contains a lot of our thinking about how we are responding to the Decadal beyond just the observables, but the entirety of how we accelerate science and amplify the impact of science. So that's the QR code there. Let's go ahead to the next slide.

Slide 25: 00:46:53

This is the QR code for our full response to the Decadal Survey. I think we emailed that out earlier, but if you missed that, here you can get right to that full point by point response. So, so this response is organized point by point according to the findings and recommendations in order. In the midterm, the response does not bundle them the way I did for presentation and discussion purposes here. Let's go ahead to the next slide and some key dates

Slide 26: 00:47:10.670

So our next CESAS meeting will be the fall meeting, November 4th and 5th. That's out in California, and of course there'll be public sessions and those will also be virtual. As I said earlier, we have been talking with the Academy leadership about how we might make the CESAS format more of a dialogue and we will be doing that at this CESAS fall meeting. So you will see a different format than you have in the past. We will have an ESD Town Hall at AGU that will be on December 10th over the lunch hour. We really look forward to seeing many of you there. Likewise, we'll be holding a Town Hall at AMS. That's, of course, in January, but we don't yet have a date and time. This is just the very near-term events, but, there'll be additional events in the new year. So we invite you to look for those. I think that might be my last slide. I remember correctly? Can we click next just to see what happens?

Slide 27: 00:48:53.100

There we go. All right. That was the, that was the last slide. So now I think we can probably, j just go ahead and take down the slides and get to any questions.

Question and Answer Session

00:49:13.144

Wendy Mihm: Alright, so we are starting to collect, a couple of questions in the Q and A section. I just want to encourage everyone, if you've got a question, that's the way to enter it. We're still collecting a couple in. It looks like people are starting to type some things in. I'm going to give folks a minute or two to get their thoughts in.

00:49:36.090

Q: Wendy Mihm: Karen, we're going to flip to you for this first one that we have, which is "How was NASA responding to the Decadal Survey recommendation to break out Landsat Next from the ESD budget and advocate for Landsat Next cost uppers independent of the full portfolio?"

A: Karen St. Germain: I'm trying to remember how we actually addressed that one in the response. The fact is we have been advocating, or making the case is probably a better word for the budget, that we need for the full set of observations: Landsat Next, as well as the Decadal missions. The larger budget pressures are not only NASA Earth Science budget pressures, they are true across government. That's really been a challenge there. But, the answer there is we have been including the full cost of all of the missions in each one of our budget submissions, and making the case through the congressional justification process. Writing the justification for all of those things into those documents and briefing on the Hill and so forth. So, this was I think was sort of a tough recommendation because we have been asking for those resources. It's just that, in constrained budget times we haven't received them.

00:51:41.475

Wendy Mihm: Thanks for that Karen. We also are seeing some other questions start to come in. So we're just going to give the community a minute or two to keep answering questions, and then we will throw some over to our leadership team.

00:52:53.940

Q: Wendy Mihm: We have one coming in that we're going to throw to Jamie Wicks. Jamie is standing in for our Flight team who is in India right now. And that question for you Jamie is "When is the Landsat Next SRR scheduled?"

00:53:33.007

A: Jamie Wicks: Yep, there you go. Should have checked that earlier. So, currently the Landsat Next SRR is not scheduled, but it will likely be sometime in 2025.

00:53:56.212

Q: Wendy Mihm : Our next question is for Katie Baynes. Katie Baynes come join us. The question is, “Is there a current strategy to make NASA's Earth Science data more accessible, findable, useful, et cetera, for wider audiences to help realize the Earth Science to Action goals?”

A: Katie Baynes: I'm Katie Baynes, the Earth Data officer and hopefully you're all aware that we have almost 10000 collections of Earth Science data from all of the missions that we've been launching since the sixties. It's a great question. We do have a current strategy on moving a lot of our data into the commercial cloud and using more standard, widely-applicable formats like cloud optimized geotiff. At the same, we're really working on making our data more findable with better metadata for research users, but at the same time, we're looking at how we can expand our audience to include folks who are using GIS tools or who want a simpler way to answer and make decisions. So that is something that we're constantly working on and reaching out to the community. Part of that big arrow that Karen mentioned, the virtuous cycle, we conduct an annual survey where we listen to our user community and then we actually have programs that are really focused on bringing outside users in to understand what data NASA has to bring to bear to solve societal problems and climate problems and understand more about our changing planet.

At the same time, creating places like the Earth Information Center and tools where people can actually interact with the data in a more intuitive manner. So I think that this is just the start of the efforts that we've been putting towards this, sites like the Greenhouse Gas Center, and the Earth Information Center or earth.gov, is really where we bring some of this data to bear on society's issues and try to bring more insight into what we're doing to help. Any feedback that you have, we're definitely listening, so, love to hear more about your thoughts on how we can raise that impact level as well.

00:56:17.101

Wendy Mihm: Awesome. Thanks so much Katie. All right, we currently don't have any questions in the chat, so we're just going to have a little silence again, a little bit more time and space for people to enter questions if they have one.

00:57:49

Q: Wendy Mihm: Okay, we've got another one that's come in and we're going to throw it to two people at the same time and see what happens. So we'll throw it to Jamie and Karen to answer the question: “Are there any updates on SBG VSWIR acquisition schedules? RFI, RFP, et cetera?” So we'll throw that to you both and you can rock paper scissors for who goes 1st.

A: Karen St. Germain: 00:58:18.765 -

Sorry about that. Jamie, do you have any dates in front of you?

Jamie Wicks: I am finding them. It's going to take me a minute though. Okay.

01:20:03.275

A: Jamie Wicks: Hey this question, are there any updates on SBG acquisition schedule, RFI, RFP, et cetera? Yes. So the, the SBG sphere accommodation spacecraft study RFP is out. They have to complete that study before they hold a mission definition review, and then the spacecraft RFP is expected sometime in early 2025.

Correction to this answer from Jamie Wicks

- The project released an RFP for the VSWIR S/C accommodation study in late September. The response to the RFP is due this week from 2 possible S/C vendors. Once we receive the RFP responses, we will evaluate and expect to start contracts in November with the 2 possible vendors for accommodation study. Study will be for approximately 4 months.
- Current estimate for release of the VSWIR/S/C RFP (open to all US vendors) is Q2 of FY26 with a possible VSWIR S/C selection in FY27.

Karen St. Germain: Okay. All right. Maybe we come back to that question and talk about the next one rolling in.

00:58:42.345

Q: Wendy Mihm: All right, sure thing. The next one rolling in and Karen, we're going to put you on the hot seat for this one as well. "Could you update, give us an update on plans for post EOS Terra?"

00:58:57.300

A: Karen St. Germain: Oh, interesting. It's specific to Terra. So, as most folks know, we are in the process of what is likely or certainly our last senior review period or last extension period for the EOS missions. So they will have to be decommissioned. That's for us to be compliant with the rules to decommission them safely. We have a significant effort going on. I'm not sure if the question was really about data continuity and that sort of thing. We do have an effort underway across all of the EOS missions, to transition users from the EOS source data to, where applicable, other sources of similar data, whether they are NASA missions or they are NOAA missions. So that work is underway and it's a lot of work because we have a lot of users. This is a victim of success situation because those missions have been so productive for so long, that there are a lot of users who are depending on them. I'm using the word users broadly, of course. Many of the users are our science community, and then there are also many applications, NASA applications and non-NASA applications that make use of those data streams. So we are in the process of working on that data strategy and engaging with our partners in particular NOAA on a path forward to try to create as little disruption as possible in those sustained data streams.

01:01:17.801

Q: Wendy Mihm: Thanks Karen. We've got our next question coming in, and this one is for Katie Baynes and then maybe hand that one over afterwards to Tom Wagner. The next question is, "Will NASA be integrating other public sources of environmental information such as Carbon Mapper into our data sets? What about ESA's growing Earth science catalog?"

01:01:45.443

A: Katie Baynes: So Carbon Mapper actually has NASA data as some of its sources. The AVIRIS next generation facility device at JPL. We actually already have those data products in our catalogs. Similarly EMIT is also included in our catalog. I think when we talk about other sources of environmental information. I think that we have to be really judicious and careful about how we partner with these folks. There are fledgling partnerships with the EPA and things like the Greenhouse Gas Center and we are looking to expand those sorts of levels of interaction beyond NASA data, but it's not something that we've historically done, on a regular basis. It's something that I'm interested in expanding our ability to do, but very carefully because, those folks developed that data, they catalog that data, the metadata and all of that stuff that you need to have clear, findable, accessible data has been carefully prepared by them. We don't currently have a way to expose that, through our catalogs. Now we do participate in the Committee on Earth Observing Satellites, working group on information systems and services that maintains a data catalog that does contain dozens of international data partnerships including ESA data sets. So I think I'd really like to hear more about that question and have a discussion on it because while the Open Earth science catalog out of ESA does contain several hundred data sets. We are already partnering with ESA on data standards metadata standards, and data exchange. I think we'd have to have more of an in-depth conversation to really tackle that. The answer that you want is probably more subtle and nuanced than I can probably give you in a 2 min synopsis, but the answer is yes, hopefully judiciously and intentionally.

01:03:50.542

Q: Wendy Mihm: Excellent. Thanks Katie. Alright, so the next one is in is for you Karen St. Germain, When can we expect the AOS-Cloud draft?

01:04:04.485

A: Karen St. Germain: I would say, we are working on that right now and the timing is going to depend a little bit on what we learn about our budgets moving forwards. As you all know, we are in a continuing resolution, so we can't start anything new right now. But within the next few months we would hope to see more information about the FY25 appropriation and the FY26 budget requests, and that would, allow us to move forward.

01:04:49.543

Q: Wendy Mihm: We have a question about whether ESD has a schedule of missions and programs that have reached their useful life or achieved their core mission and/or will or should be decommissioned.

01:05:10.790

A: Wendy Mihm: So that's, that information is captured on our fleet chart and we can make that fleet chart available on the same location where you'll see, the video of this and the transcript and our response etc. So we'll put the fleet chart up there as well.

Karen St. Germain: Wendy I'll just add to that answer. For the decision about continuing versus decommissioning, NASA has a formal process. That is the senior review process. And so, that's where those decisions get made. Of course, absent an on-orbit emergency or significant change in status. (* see comment at 1:06:35)

01:05:59.301

Q: Wendy Mihm: Excellent. Thanks Karen. Alright, there is a question about, "Is there a way to see the talks and updates that are given at AGU and AMS if someone isn't attending or isn't registered for the conference?"

A: Wendy Mihm: The general overall answer to that is yes. We can put those talks so we'll have an ESD town hall at those meetings and we can make the ESD Town Hall available to the community afterward.

01:06:35.082

Karen St. Germain: And just a quick follow up on my, note about the Senior Review process. The next Senior Review, will be in 2026.

01:08:51.824

Q: Wendy Mihm: Here is the next question/comment. It's important to remember we are all on the same team. I love everything about that. Okay, I added that part." It's important to remember we're all on the same team. How can the science community help you accomplish your ESD goals?"

01:09:12.289

A: Karen St. Germain: Yeah, I'm going to hand that to you. Thank you. And I I really appreciate the statement and the question and I really, I could not agree more that it is especially true when we are in challenging times that it becomes ever more important that we hang together, stick together as a community, make the case for the entirety of what we do. So, there are lots of things that, that you can do. For starters, tell your stories, tell the story of the work we do, of the work that you do. And, I'm not only talking to the scientists here, I'm talking to the engineers, I'm talking to the acquisition specialists talking to the whole community of people that contribute to the effort. Tell your stories, talk about what we do to, to your friends, your family, your neighbors. That's one thing you can do. Just to raise that level

of awareness. I, just yesterday, gave a talk virtually in the morning to my hometown high school. Talking to them about what we do. So that's one level of engagement. Especially important now is for, the community to make their voices heard, to our stakeholders. I want to emphasize here that it's always tempting to make the case for our own personal missions. We've all been there. But I think it's especially important, given the urgency of the work we do and given how interrelated or interconnected the Earth system is, to not think of, of things in terms of winners and losers, but to think of this as an entire community effort to advance the entire body of knowledge and to advance the use of science. So I cannot say it often enough. Use your voice. Use your voice, personally, use your voice institutionally, to make the case and talk about what we do and how important and impactful it is.

And talk to us, right? This is the third piece here. The individual members of the community may see and hear things from a different perspective. Please share that back with us, whether it's to any one of the folks that you see on the team today. They don't all have their cameras on, but trust me, they're all there. If you know anyone on the ESD leadership team: your program manager, your program scientist. Share those insights back with us. We want all of our decisions to be fully informed and supported by the community. So if you have observations, if you have suggestions, please communicate those back with us.

So those are at least three things, and I really appreciate the question.

01:13:07.430

Q: Wendy Mihm: Alright Karen, we're going to throw it back to you for another one. "Could you speak a little bit more about the Industry Day events and plans for the coming year?"

And I think I want to also frame that in the bigger, the broader picture of increasing our communications, which is one of the three main things that you just walked us through, and when I think about that, I think about not just another industry day, but also maybe communications around ROSES or other chances to engage with ESD on things like Earth Science to Action etc.

01:13:40.653

A: Karen St. Germain: We are planning to do another Industry Day coming up. I would say it probably will not be until the springtime or so. That's a forum where we, we talk about the nitty gritty of all the missions, in particular the Designated Observable missions, the ESO missions, but also others. We talk about upcoming opportunities, and for me personally, that's been a really important format and forum for getting, pretty blunt feedback from our industry that can inform our paths forward. So, we don't have a date scheduled for, for that one yet, as I said, though, we liked the format we did last time, which was we held it in that auditorium at NASA headquarters. It's outside the security boundary. And we also had a virtual element to that. So that will be coming up.

I also mentioned things like the ROSES community forum. The ROSES is our mechanism for soliciting for proposals. We thought it would be a great idea, especially in light of the Earth Science to Action strategy, to have a Community Forum around the release of ROSES to talk about what adjustments we have made. What's the same and what adjustments have we made? What new opportunities are there associated with this new strategy? That's something we're going to be really excited to talk to you about. So, so please do come to that session.

And in addition, other feedback events. We'll have some sessions around implementation of the Earth Science to Action strategy. So, watch for those. We will announce those things in multiple ways, including through the Postcard, but not exclusively. We'll also put those dates up on our websites. So, looking forward in the new year to injecting new energy into our back and forth with the community.

01:16:23.527

Q: Wendy Mihm: And I just wanted to underscore Karen's plug to subscribe to the Postcard. It's a great reminder and way to keep in constant touch with us. Alright, so the next question I'm going to hand over to Katie Banes, because it's about data. So Katie pop on. Here's the question. "Data volumes are increasing with the multiple satellite missions available and those to be in launch. What's the plan to address the need of multiple users just to access increasingly, more challenges with regard to volumes of data."

And the person who posts wants to also note that they're aware of budget constraints as well as budget limitations from satellite missions, so kind of within those budget constraints, how are we managing this huge, huge plethora of data?

01:17:16.470

A: Katie Baynes: Sure, I mean, so I'll tackle the economic question first. We are talking about satellite missions now, we're planning for the future, that are going to blow away volumes of the past. Luckily, we've been watching and learning from our European counterparts in the Copernicus program and the Sentinel missions. The NISAR mission itself will be really testing the limits of how people can interact with data. We're moving from an era of kilobyte sized files and megabyte sized files to gigabyte files, and now we're really in the multiple terabyte accesses of data or sizes of data via files and products of the future. It's really getting untenable. So, we have been moving our data into commercial cloud and one of the reasons that we did that was to put all the data in one place to allow for a seamless integration across those data, but also give people the opportunity to do data reduction. Maybe you don't need an entire swath of data. Maybe you can just draw a polygon and download the data you need. So we've been trying to create tools to allow for data reduction. And at the same time looking at data strategies, and looking at our data policy, can we put some data that we know 80 % of the time it will ever be accessed within the first 5 min of it hitting our archive. If we can say, ok, well, the 80 % mark has been hit, we're going to put that one in cold storage until the next retrieval, we can actually save a lot of money. If we can, we're also exploring things like on demand processing or if we're doing an instrument sharing or we're doing a mission that has international components, maybe we aren't doing a full mirror of the partner's data. So there are a lot of different strategies that we can do. I know that the ESTO program has been looking at data reduction strategies on a side highlight itself. We're looking at how we can utilize smart downlink. We look at how we can utilize data compression, we look at how we can utilize hot and cold storage. We also look at how we can actually distribute less data to get users the data products that they want when they want it. So, there's a lot of different strategies. It's a multi pronged approach on how we're going to be approaching this future. We have partners who are dealing with the same problems. I was out in Sioux Falls last week talking to the Landsat Next folks and we're

swapping notes. So this is something that's increasingly on top of our mind, not only at NASA but in other agencies.

01:19:51.256

Wendy Mihm: Okay Excellent. Thanks Katie. Alright, so we are going to throw the mic back to Jamie in Flight for, to answer.

01:20:03.275

A: Jamie Wicks: Hey this question, are there any updates on SBG acquisition schedule, RFI, RFP, et cetera? Yes. So the, the SBG sphere accommodation spacecraft study RFP is out. They have to complete that study before they hold a mission definition review, and then the spacecraft RFP is expected sometime in early 2025.

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- Current estimate for release of the VSWIR/S/C RFP (open to all US vendors) is Q2 of FY26 with a possible VSWIR S/C selection in FY27.

01:20:52.550

Q: Wendy Mihm: All right, next question teed up for Karen St. Germain. "On the one hand, the Midterm assessment points to enormous societal and economic value of EO. On the other, it calls for more clear articulation of societal value. So what's missing in the value of appraisal? Is it better storytelling, more rigorous economic studies, something else?" and Karen I will hand that one off to you.

01:21:23.796

A: Karen St. Germain: Okay, I keep muting to make sure I don't create background noise here. Appreciate that. This this really goes to, in many ways the heart of the Earth Science to Action strategy. It's not just about articulating the value. It's about actually delivering the value also. And, you know, the, the best people to talk about the importance of what we do are not us, right? When we talk about the value of what we do, we can tell great stories and we do and we've been really expanding the approaches we take to telling those stories and we've talked about a number of them here today. But it's even more powerful if other people tell their stories about how they engaged with NASA, how it benefited them. And that's really, that, that's one of the real reasons why the Earth Science to Action strategy is so important. Because there are so many people that can or could and should be using our science, and they don't today because they don't know about it. So, as we increase the use of our science, the visibility of our science among communities that are not just our own, the more advocates

we have for, for the work we do, the more the more people we have speaking out and telling their stories. Because remember, we care very deeply about our science and our missions and advancing the understanding of the Earth, but when we talk to stakeholders, they have a long list of things that they care about. And, and chief among those are, are the cares of their constituents. So again, connecting science to lives and livelihoods, in very meaningful and impactful ways is really fundamentally about, delivering on the value of science and, exposing the value of science to people who don't know about it and understand it today. So this is all sort of part and parcel of the strategy we're taking here is to increase the impact and the visibility of our science and its value to frankly, communities from my hometown to yours, to theirs, and across all economic sectors.

01:24:30.983

Wendy Mihm: Okay. So we are almost at time. Karen, did you want to say any parting words before I end with just a little bit just to close out and some final reminders of housekeeping.

01:24:43.468

Karen St. Germain: So we've been on the line for about an hour and a half and for most of that time we had well over 200 people joining into this conversation. So first let me let me just say thank you. Thank you for the work you do. Thank you for joining us in this conversation. We are all here because we are trying to make our enterprise as strong as it can be, as healthy as it can be. And we really appreciate that you, you care enough about that, as we do to spend the time with us today in this conversation. We hope you will continue to engage with us, to join us at the CESAS meeting, to join us in our community forum, events and to reach out through whichever Headquarters point of contact that you're comfortable with. Please do reach out to us, with your thoughts and concerns, and particularly your ideas.

I should say one more thing. Thank you to the Midterm committee for doing the Midterm assessment. We really appreciate the feedback. We appreciate all the folks who responded to the questions the Midterm committee asked and that of course is the catalyst for what we, for the conversation today. So.

01:26:15.986

Wendy Mihm: Sure thing, it couldn't have said it any better myself, certainly that was the perfect wrap up. Alright, so just a reminder for folks, we are at time, but just go back to the same location, the community forum webpage. That is where you'll find the full transcript of this. The video and the slide deck that Karen shared today and of course the full assessment and our response, which is already posted up there. Give us about two weeks to get the transcript and a video up just because it takes a while, the sorting through and creating the transcript. So give us a little bit of time, but check back watch that space, and thank you again for your time and we'll see you next time.

01:27:00.565

Karen St. Germain: Bye everyone. Bye everyone. Thank you.

Questions answered directly in the Q&A feature online

Thomas Meissner

Q: What is the current estimated date for the NISAR launch?

Wendy Mihm

A: Work on the NISAR (NASA-ISRO Synthetic Aperture Radar) radar antenna reflector is done, and NASA expects to transport the reflector to India before the end of the year.

The current eclipse season is underway now through February 2025.

During the eclipse season, the periods of alternating sunlight and shadows due to the position of the Sun produce temperature fluctuations on the observatory that could adversely affect deployment of NISAR's boom and radar antenna reflector.

Art Charo

Q: The CESAS Nov. 4-5 meeting agenda and dial-in information will be posted here: <https://www.nationalacademies.org/our-work/committee-on-earth-sciences-and-applications-from-space> Could you mention this?

Kate Becker

A: Thank you Art. Everyone see Art's information about CESAS meeting above