Below is the script written out by the trainers for this program. It is not a word-for-word transcript of the recorded training, but will still give you all the highlights and information covered.

[Slide 1]
Welcome to all who have logged in today to this webinar series: Remote Sensing Training: Methods and Best Practices. My name is Brock Blevins, training coordinator for NASA's Applied Remote Sensing Training Program, and I will be your host for this 3 part webinar series. Also contributing and presenting over the next 3 weeks will be Ana Prados (ARSET's Program Manager) and Elizabeth Hook (ARSET's Communications and Technical Writer/Editor).

The purpose of this 3 part series is to engage our fellow Remote Sensing Capacity Building Programs, or those looking to establish programs, share some of the methods we at ARSET have found to be effective, but also to begin to facilitate an ongoing conversation with all those who are participating.

Over the past few years, working along with other training programs, we have seen that, depending on the size and scope of a capacity building program, there are many successful methods to conduct remote sensing trainings. We will discuss aspects of our program, but since we know there is no "one size fits all" model, we will be asking for those participating to enter into the discussion, share the methods your programs employ, and, ideally, we can all learn from each other and create a robust network of capacity building practitioners.

[Slide 2]
So how will we do this? Here is the outline for the 3-week series. Week 1 will cover end-user needs assessments, promotions, etc. Week 2 will cover onsite or in-person trainings and evaluations, with week 3 covering online webinars or distance learning.

Each week will have a series of topics important to capacity building, for each we will discuss them in general, provide insight into how ARSET

handles the topic, but also, and this is an important part of the process, after each topic we will open the forum and ask how you and your program addresses the topic and any other information you find important to discuss.

Now, since we have scores of participants in the room, it will not be logistically possible to provide microphone privileges and to ensure the mics will work properly for everyone. When we have the open forum periods, we ask you to share your program's methods per topic by using the chat windows.

We will also display the chat windows again at the end of the training so you can copy and paste any or all responses. As you see here, the topics for each week, from end-user needs assessments, promotions, to creating effective presentations to all the details involved in conducting onsite and online or distance trainings.

[Slide 3]
All these topics fall into what we consider seven steps to a successful remote sensing training. Of course one can break these steps down further or even add steps to the sequence, and that will be particular to your program. We look forward to hearing of those and allowing a space to discuss them.

But for ARSET, we have worked off of this model. It begins with a mission statement, knowing your end-user needs and developing a network, promoting, developing and conducting your training, to evaluation, not only of the training itself, but of its efficacy, impact, and finding future needs, which can be used to guide future iterations of a training's life cycle.

[Slide 4]
And the learning objectives throughout the 3 weeks, from ARSET and from each other, will be to:

- Understand the key steps to developing onsite and online trainings
- How to build a network and promote a training
- How to conduct these trainings

[Slides 5, 6]
To begin, I will briefly introduce ARSET, NASA's Applied Remote Sensing Program. Here is the team and if you have taken previous ARSET trainings, you may be familiar with some of the team, grouped here by thematic area. We are a team of 15, spread across various NASA centers, with a headquarters in Maryland at the Goddard Space Flight Center (GSFC).

[Slide 7]
ARSET is sponsored by the Applied Sciences Program within NASA's Earth Sciences Division. The applied sciences program supports applied research and targets projects focused on innovative and practical uses of data from Earth observing satellites to inform decision-makers around the world. ARSET works with applied science program managers, principal investigators, and data and tool producers to communicate and train upon those datasets, tools, and portals that are operationally ready to be applied to disasters, land management and ecoforecasting, health and air quality, water resources, and wildfire management.

[Slide 8]
ARSET provides online webinars, typically in a series format, convening 1 hour per week for 4-6 weeks, with a focus on data access demonstrations and applications. We also have onsite trainings, these will be 2-4 full days where we partner with a certain group or stakeholders and co-produce training materials, exercises, and case studies most relevant to that stakeholder organization. We also have a train the trainers program, for those who are interested in conducting their own remote sensing trainings.

[Slide 9]
For both the onsite and online trainings, we take a gradual approach. Our fundamentals of remote sensing webinars are available for viewing on-demand and are intended for those with little or no remote sensing experience. These cover the satellites, sensors, and terminology necessary to understand the many applications of these Earth Observations.

Level 1, or basic trainings, then move on to specific applications such as air quality monitoring, land-use change, or flood monitoring, highlighting those specific datasets and tools, showing step by step portal access, discussing strengths and limitations, and importing into a GIS.

Our advanced trainings, or level 2 trainings, are available as onsite trainings and, as of recently, available online for greater reach globally. Usinging guided exercises and homework, these advanced topics include generating land cover maps, estimating water basin budgets, tracking exceptional air quality events, or running code to read Level 1 or Level 2 satellite swath data.

[Slide 10]
Since 2009, ARSET has reached almost 8,000 participants from over 140 countries and you can see those statistics here. Our health and air quality themed trainings were the ones we started off with, which is why there are a greater number of those trainings compared to the other themes. But as you can imagine, we have had great interest in water resources, disasters, land, and wildfires recently.

[Slide 11]
It is built into the ARSET mission to reach as many around the globe as possible and the maps here show we have been doing that. Of course, not every capacity program is mandated to train globally. Many train internally only and some focus on one particular sector or theme. This is all based on one's mission statement. Which brings us to our outline for today's session.

[Slide 12]
Starting off with, defining your program's mission statement. We will then cover assessing end-user needs, methods to build a network, training promotions, and developing training materials. After each topic we will open things up for discussion and sharing.

[Slides 13, 14]

Which brings us to step one, developing a mission statement. Why do we do this? A mission statement defines the key purpose of a program, the intended audience, and the impact you wish to accomplish. These are all key elements that help guide content, partnerships, and content of training activities. So purpose (what), audience (who), and impact - in other words, why are doing this? What is the end goal?

For example, ARSET's mission statement is: To increase the use of remote sensing resources by environmental managers for decision-support. This is accomplished through onsite and online training that teaches participants how to access, visualize, and apply Earth science data.

[Slide 15]
For us, our purpose is to build capacity to use remote sensing through training.

[Slide 16]
The audience is environmental managers, decision-makers, and policy makers.

[Slide 17]
And desired impact is to help improve participant's decision making.

[Slide 18]
So let's hear from those online. Does your capacity building program have a mission statement? If so, please type it into the chat box. Please be sure to include the name of your program, and any additional information that might be useful, such as location, who you target, etc. This is where we can begin to share best practices among the programs tuned in today.

Possibly we can find other programs with a similar focus, or geographic region of interest. We may even find potential opportunities for collaboration through these forum periods, so I encourage you to share. If you are establishing a training program or expanding one, also feel free to observe other's responses to help frame your own. You can copy all the

text in the chat windows to review and compare later on. Remember we will show these again at the end of today's webinar.

[Slide 19]
Before we move on to the next topic, end-user needs assessments, we want to define some relevant terms. Going forward, we will be using the terms participant, end-user, and stakeholder. Depending on your program, these terms may have different definitions, or variations, or them. But so you know, this is how ARSET defines them.

A participant is a person or organization who attends a remote sensing training. An end-user is a person or organization who uses remote sensing data and applies it to an environmental problem or question. It may be a decision-maker and may use data to make decisions. A stakeholder is a person or organization who benefits or is impacted by remote sensing data, information or decisions derived from the data.

So keep these in mind if your program has slightly different definitions.

[Slides 20]
So let's talk end-user needs, or those persons or organizations who use remote sensing, or may potentially use remote sensing data.

[Slide 21]
A key best practice in remote sensing training is to collect end-user needs assessments. In order to be effective, trainers need to understand the needs and wants of the participants.

The information collected can then be integrated into decisions on training type, content, or topics, so it can be tailored to address their unique environmental or decision support challenges. These decisions can depend on the technical expertise of the participants, sector, or types of questions they are seeking to address.

A program should also address these assessments throughout the training life-cycle - both before and after the training. The first step is to establish a

dialogue between the training program and the potential stakeholders to determine if there is a match between stakeholder or end-user needs and what your training can provide. From there, a relationship can be established to, in the best case, co-produce the agenda so needs can be fully integrated into the content. After the training, interviews, surveys, or less formal means can be used to gather additional insight into end-user needs. This information can be used to direct future iterations of the training.

[Slide 22]
Some tools a program can employ include:

- Training registration information: besides demographics, you can also inquire what participants want to take away or potential applications of the remote sensing datasets or tools
- Interviews can go a long way to digging deeper
- Ad hoc questions presented during question and answer sessions. Many times the participants use this time to ask questions of the presenters, but that can also be used to ask this captive audience their needs. I always like to try to make it a discussion with a lot of back and forth to really begin to understand the participant's decision making questions and potentially how remote sensing can address them.

Of course, there also anonymous surveys, either pre- or post-training. Others include inserting yourself into the community of practitioners by getting involved in user working groups, or subject matter experts. Whether made of the end-users themselves, data producers, or professional organizations or societies.

[Slide 23]
A few of the many tips include to, as I mentioned previously, collaborate with the community. Be sure you are asking pointed questions. Such as:

- What is preventing you or your organization from fully using remote sensing resources?

- What is your organization's main type of research or environmental management activity?
- What specific question or challenge is your organization trying to address?
- What type of training is your organization interested in?

Or directly, what training topics do you want? In other words, what can we do to serve you better? Finally, assess if the training will in fact address the needs. Essentially, don't oversell.

[Slide 24]
So, let's use this time to share. Because, depending on the goals of your particular capacity building program, these end-user needs assessments can take a number of different formats and desired outcomes.

For instance, in the chat box, feel free to share if your program collects end-user needs, how you do so, possibly how often. What would be beneficial is if we all could share our methods and why or why not those methods are effective for the purposes of your program.

[Slides 25, 26]
The next topic is building a network. Why do this? Well, this depends on your program. If you training exclusively internally, a network may already exist. If you are like us, and we wish to train globally to address a number of sectors and needs, this network serves to identify stakeholders and potential collaborators. It helps to find potential end-users and training participants.

This network also provides an ever-widening pool of those from which to inquire training or data needs to tailor content or discover potentially new training topics. If a large portion of your network is asking about terrain data and monitoring sea level change as it applies to infrastructure planning or disaster mitigation, then there is a need that can be addressed.

[Slide 27]
One way to handle your network is to maintain an end-user database. We at ARSET, since our intended outreach is so large, we maintain a database

that is sortable by location, sector (such as central government vs. NGO vs. private company), organization, and the theme in which the user participated, such as disasters, air quality, or land management.

We can use this information to identify gaps in coverage by region and sector. This way, gaps can be addressed when determining future promotion activities.

[Slides 28, 29]
Which brings us to our next step: training promotion. ONce again, this will be program specific for the scope of your training promotions to find the appropriate organizations or people to reach out to.

For ARSET, we promote trainings to applied science professionals and decision- or policy-makers. Anyone who is able to make Earth observations actionable. We also reach out to those who have shown environmental need, but also those not yet reached previously, those unaware of the benefit of NASA's open datasets and tools.

We also like to promote to those organizations with a high potential for future collaboration. A lot of times these groups have a unique knowledge of a community's unique decision-making activities. And how remote sensing data can fit into that equation. Also, it can be very effective in that representatives from organizations tend to trust data and trainings if others within their community have shown its utility and success.

[Slide 30]
Some common methods include:

- Email
    - Listservs
- Existing websites, portals, & groups from stakeholders or other organizations
- Networking
- Social Media

Social media is taking on so many forms each year that it has become an effective vehicle to get the word out to your desired audience.

[Slide 31]
For example: ARSET employs many of these methods, with email and listservs accounting for almost half of what has brought our trainings to participant's attention, whether coming from us or passed along from one colleague to the next.

We also post each training on certain websites - such as FedCenter, or EOportal. We also perform targeted outreach and promotion to those with which we could potentially collaborate, or use the outreach database that is used to fill those caps in coverage we may notice from our past participant lists. Lastly, Twitter is a new platform for us and Elizabeth Hook, our communications and technical writer/editor can tell you about.

[Slide 32]
Social Media is a big, potentially very long conversation to unpack. So we're going to go through some general things quickly.

If you decide to create a social media account of any type for your program, have a clear idea of its purpose. This is going to help you with figuring out what kind of things to post. Another component of this is that social media almost always takes more time to do well than people think it does.

Post to your account and engage with your community regularly. This doesn't mean you need to do something every hour but, for instance, ARSET has a twitter account. We typically tweet a few times a week, and we try and respond to people in a timely fashion.

One tool that can help you post consistently is maintaining a schedule. You can figure out what you'll post when to keep from doing all your posts at one time, or to fill in where you may have gaps.

The only official social media account ARSET has is its Twitter account. During trainings, we plan out tweets – these top two images are examples. This one on the left is promoting a recent training. On the right is a tweet we planned during a training we did in Brazil. This training was taking place

in Spanish, so we definitely had to plan our tweets out ahead of time to get them translated.

In addition to planned posts, sometimes interesting facts or things pop up in the training. So those can supplement as well. Pay attention to replies and questions that come in so that you can answer them or convey them to the speakers.

The final thing about social media I want to say is that you should also be aware of conversations about your program and organization that are happening that may not directly involve you. This picture on the lower right, here, I found in March when I was looking around for other people talking about ARSET. Apparently, at an investigative reporters & editors conference, someone was giving a presentation on remote sensing data and mentioned ARSET. And this tweet in particular was only retweeted 12 times, but by people with a cumulative 38,650 followers. And we had no idea that ARSET was going to be included in the presentation.

[Slide 33]
So let's once again share amongst the programs here today on the topic of promotions.

[Slide 34]
We're going to cover developing training material in all 3 of these webinars. What we wanted to focus on today is a general overview of building and giving effective presentations & slides.

[Slide 35]
When you go to give a presentation, an important thing to consider before you get started is: who is your audience, what is their experience level, and what questions are they looking for you to answer? Knowing these things allows you to have context for your presentation and what you need to accomplish.

When you're building your presentation, it's important to cover material thoroughly, clearly, and at a steady pace. But, and this is especially true if

you're giving a technical talk, if your audience is new to the subject matter, you need to talk much slower than you normally do. Conversationally, I tend to talk pretty quickly – and if I'm nervous about a presentation it's very easy for me to speak too quickly. So when you're practicing your presentation, think about how you're speaking.

Speak clearly and articulate well. If you're giving an in person presentation and there's an option to use a microphone – take it. I have been to many presentations where presenters are offered a microphone and they say, "Oh, I can talk loud" and they would have really benefited from the microphone. Unless there's huge technical difficulties, please just go ahead and take the mike. It allows people in the back of the room to hear you clearly and hear you well, and it means you don't have to strain your voice.

When you're covering material – even if you don't have an audience brand new to the material – define your terms and acronyms when you first use them. And don't assume the audience will remember an acronym you defined once 20 slides ago – go ahead and redefine things occasionally.

And practice. This is very similar to the microphone thing – a lot of people think they can wing it when they give presentations and it usually comes off sloppy. For most people, being familiar with the material and the slides also makes you more confident, which gives you more authority as a presenter. Practice also helps you figure out what presentation techniques will work for you. If it's in person, do you tend to wave your hands around too much? Do you tend to stand *too* still?

[Slide 36]
Most, but certainly not all, presentations involve a slideshow. There's conventional wisdom that you shouldn't read off your slides, that you shouldn't jam all your content onto a slide. But there's also another consideration – what relationship does the presenter have with the slides?

What I mean is this – you can have slides with the ideas and context of what you're talking about, and the presenter there is to provide supplemental information. This is great for if you have people looking at

your slides later without you. Then you have the other end of the spectrum – where you just have very high level images, words, things on the slide but you need the presenter there to talk about the slide. This slide, for instance, is much further on that side of the spectrum.

Most of ARSET's slides are in the middle. We do post our slides online, but we also want people to listen to the recording. So you should be able to get things out of the slides if you aren't listening, but for the full picture, go ahead and listen to the presenter.

[Slide 37]
Once you figure out where on the spectrum your presentation is, there are a few key things about developing an effective presentation. Presentations should provide visual support for the audience – things that are useful for them to retain. Presenters can certainly take cues from slides – they can keep them focused and on track with where they are – but try not to use your slide as a teleprompter.

When developing slides, especially with bullet points, use the slide to reinforce the points you're making. Instead of reading out the list of things on your slide verbatim, talk about the topic – show the audience what you mean by those items.

The picture on this slide shows a TED talk given by Fred Jansen, the former ESA Rosetta Mission Manager, in April 2015. His slides for this presentation certainly fall on the more sparse end of the spectrum, but in the slide behind him you can see the flight path of the spacecraft as it goes to approach the comet it's studying. The image and text tell the audience something, and reinforce the point he's making, without being a long string of text.

Now that you know what slides should be, we'll talk about some tips for how accomplish those things.

[Slide 38]

All three of these things here work together. On one level, if you just make an inoffensive slideshow that doesn't break, it gets the job done for you. But if you want to have polished, professional looking presentations, consistency is one of the easiest things to do to refine your presentation. And part of consistency is paying attention to detail.

For me, when I'm under a tight deadline to turn a presentation around – paying attention to detail is hands-down the easiest thing to fall behind on. But it's also the sort of thing that contributes to making your presentation look sloppy. And when you're building slides and paying attention to everything, make sure you don't get carried away. Keep it simple.

[Slide 39]
Being consistent in your slides covers a wide range of things. ARSET moved towards a template for all of their presentations in an effort to keep things consistent. They aren't all identical – but they look like they belong in the same family. Here you can see that the format of the slide – where the title is, the logo, is the same, but for different trainings we replace this image on the left. But the format of the interior, here, you can see that the layout is largely the same. The template also allows us to keep track of things like fonts, colors, font sizes, general formatting and things like that.

[Slide 40]
You might have a template, but you still need to pay attention to detail. Are you using the same font in the body of your presentation? Again, you might want to use a different font to emphasize something, but be intentional about it. Make sure when you copy in that slide from another presentation on another template that the fonts work.

For images, make sure they're aligned with the text – this can make a huge difference in how polished the slide looks. And when you're resizing images, try and maintain the aspect ratio.

What I mean by that is – here we have an image from the Soil Moisture Active Passive Mission. If you're looking at this image and saying, oh, to fit in this space I don't want it to be this wide. Let me just click and drag it.

[Slide 41]
This squashed appearance is especially obvious when you have words in an image, but it makes things look off if you end up disturbing the ratio of the image.

It's also respectful to credit your images if you've pulled them from a different source. It can also be helpful for your attendees. If they see an image or graph they find interesting, they can go back and look at your slides to see where the image came from - and go to the original source to look for more information.

The other thing in paying attention to detail is considering the bullet points you have. Are all of your bullet points the same? (That pesky slide you copied in from the other presentation – did it use different bullets?) Are all of your bullets sentences or phrases? Are you capitalizing all the words in a bullet, or just the first one? And another thing to think about is what tense is your presentation in? Are you giving it all in present tense except for one item?

[Slide 42]
And as you're going through and paying attention to all of these things, remember – keep it simple. Developing slides is a balance between writing everything down that you want to cover and providing highlights and memory triggers to the audience. I had a professor that felt that you shouldn't have more than 20 words on a slide (for perspective, this has ~60).

When you're developing your presentation, try and only cover one idea per slide. Covering more than one idea at a time is an easy way to end up with an overcrowded slide. Sticking to one idea also helps your audience focus on what they're supposed to be focusing on.

There are usually some hints I use to help me identify if a slide is overcrowded. If there are a number of colors happening and text is getting highlighted in weird ways all over the place to draw attention – there's

usually too much happening. When you're typing into a PowerPoint box, if you run over it automatically resizes the text – so when that happens I stop and think about why I have so much text it can't fit in the text box. And if you just look at your slide and it's a solid wall of text – that's another (more obvious) sign. It can probably be condensed a little, and there's probably some image or something that can be added.

[Slide 43]
Now we're going to look at an example of a slide that needs improvement. It's a slide that's been generated from some ARSET content, but we can apply a lot of the things we talked about to it.

[Slide 44]
All of the text is bolded – it's something I find more difficult to read, but I know people feel differently about that. But when things are all bolded like this, it makes it hard to emphasize words you need to emphasize. So here, they've been emphasized with different colors. But there's 5 different colors happening here.

There's two different shades of blue. Two different shades of red. And this brown color. You can in theory see where they matched the color of spatial and temporal resolution to their respective tables, but it's just a lot.

[Slide 45]
Let's take a moment on the title of this slide. Titles are supposed to draw the attention of the person watching the presentation so that they know what to expect on the slide. This title is a full sentence rather than a quick, at-a-glance overview of the material.

We also talked about consistency earlier – here you have two different capitalization styles happening in the title. At the beginning, every word is capitalized (this is called title case), but later on it isn't.

The title also has some of the smallest text on the slide, which makes it hard to read and hard to focus on.

[Slide 46]
That text for the title is 18 pt – and one of 3 different font sizes happening on this slide. The biggest font size is for the tables. When I clicked on 'insert table' this the font size it defaulted to – so don't be afraid to change that.

The body of text is two different font sizes (which PowerPoint actually does by default sometimes). But you have your main points in 20 pt – larger again than your title – and list subitems at 18 pt.

Again, having everything 1 font size isn't necessarily what you want, but it's important to pay attention to whether or not your variable font sizes are confusing.

[Slide 47]
The last thing we're going to talk about is the spacing. Spacing can serve as a visual cue to the people watching/reading of where they should look. From an American perspective – we typically read top to bottom and left to right. You should keep writing direction in mind when developing slides because that's where our eyes go first.

So at the top left, where most people are going to look first, you have this line that's a feature of the template meant to highlight the title. But the actual title isn't centered and there isn't enough space between the line and the words.

The body of text is also further left of the line, which makes it look a little visually offset. There's also very little space between the text and the table on the right.

The tables are also spaced differently on the slide. The brown table has a little space around it, but the blue table is all the way up to the edge of the slide. The blue table also sits higher than the text. Between being higher up and having a larger font size, it competes for attention with the text when maybe the table should be playing more of a supporting role.

So now that we've gone through some of the things that needed to be improved, here's an example of a suggested slide that follows our tips.

[Slide 48]
I actually think the strongest thing for this slide would be to split it into two entirely different slides – one on spatial resolution and one on temporal resolution – but for the sake of this exercise, we kept them on one slide.

You have a created hierarchy – the title is more concise and larger, you see the two topics put in a list so that you can see things on spatial resolution and the table that goes with it. You can also see the information on temporal resolution, and the table that goes with that.

[Slide 49] (Brock)
Thank you very much, Elizabeth. This gets us to the end of the first session of our three part webinar series.

[Slide 50]
To summarize what we talked about in the beginning and for this particular session was developing a training mission statement, methods to assess end-user needs, how to build a network and different ways in which we promote and advertise our trainings, whether within our community or outside our community. What we'll do over the next couple weeks, we're going to talk a little more on developing training material, but focusing more on how you're developing materials as it applies to onsite trainings versus online trainings or webinars, and how to conduct those trainings. And also methods in which you can evaluate your training. The training itself or the impact of those trainings.

[Slide 51]
Next week, as I mentioned, we'll be talking about onsite trainings. Ana Prados our program manager will be talking about that. Introducing the difference between onsite and online trainings, the different levels, the structure, how we go about developing these case studies and hands-on exercises, timelines that tend to be very useful when putting together these trainings. And also a piece on program evaluation.

[Question & Answer section of the training]