

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] Speaker: Ana Prados, ARSET Program Manager

Welcome to the second week of “Remote Sensing Training: Methods & Best Practices.”

[Slide 2]

Last week was week 1, and we discussed how to develop a training program mission statement, create and perform end-user needs assessments, advertise the training, training promotion, and how to create a good presentation.

Today is week 2, and we will be focusing on onsite or face to face trainings. We will begin with discussing the differences between online versus onsite trainings and then move on to onsite trainings, including training levels (introductory to advanced), training structure, developing case studies and hands-on exercises, timelines, and program evaluation.

Next week, Brock Blevins will discuss the specifics of online trainings.

[Slide 3]

These are the learning objectives that we discussed in week 1, so to repeat they are:

- Understand the key steps needed to develop an online or onsite training
- Learn how to conduct outreach and promote trainings
- Learn how to develop and deliver effective presentations on remote sensing topics and applications

[Slide 4]

As discussed last week, there are 7 key steps to a successful remote sensing training.

Last week we discussed the first four steps: the importance of developing a Training Mission Statement, how to assess end-user needs, build a network, and promote trainings.

This week will focus on the last three steps for onsite or face-to-face trainings. Next week we will discuss these three steps again, but as they apply to online training.

[Slide 5]

This week we are covering the following topics. Online versus onsite trainings and how to develop onsite trainings, including training levels (introductory to advanced), training structure, developing case studies and hands-on exercises, timelines, and program evaluation.

[Slide 6]

Now we would like to review some definitions that we also discussed last week:

- Participant: a person or organization who attends a remote sensing training
- End-User: 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
- Stakeholder: a person or organization who benefits from or is impacted by remote sensing data, information, or decisions derived from the data

Any one person can be one or more of these categories at a time.

[Slide 7]

Invite attendees to answer “what remote sensing topics are you teaching or training on?”

[Slide 8]

(transition)

[Slide 9]

First of all, there are many forms of online and onsite remote sensing trainings. We can't cover all of them here so for illustration purposes, we are only going to discuss the differences between the two types of training from the perspective of the ARSET program.

The ARSET online trainings are a series of multi-week webinars, typically 3-5 weeks. They are generally delivered live, but they are also recorded for on-demand participation. They are 60 to 90 minutes in length. Many organizations only provide training on demand, although a few of the ARSET basic online courses are also only available on demand. They include both presentations, and exercises or homework, generally about 2-4 per webinar series.

Onsite training is held in a computer laboratory and is much longer in duration, generally 2-7 days. It is a mixture of lectures and hands on activities. Materials include guided instructions for exercises.

[Slide 10]

Here are some (but not all) criteria that need to be considered selecting the type of training.

Considerably more resources are needed for onsite training, both for trainers and trainees. The length of the trainings and travel costs both contribute to this. Online training requires significantly less resources, particularly since there are no travel costs. So you will want to consider the resources you have available when choosing between an online or onsite type of training.

In terms of the audience size, onsite training is not well suited for more than about 50 participants, whereas modern online training software can accommodate hundreds. So you can accommodate more people with an online training, but you can't give them the one on one attention that you can provide with onsite or face to face training.

ARSET has been successful in teaching basic and advanced topics through both types of trainings, but there are some exceptions – there are some complex or advanced topics that do not work well in an online environment.

[Slide 11]

ARSET offers trainings at several levels. Levels here refers to the technical complexity of the material being presented. Level 0 is for participants that are entirely new to remote sensing. It covers the very basics of remote sensing such as orbits, types of instruments, etc.

Level 1 training covers the remote sensing platforms, sensors, data products, and tools to access and/or analyze the appropriate remote sensing data for a specific application. They are intended for those relatively new to remote sensing, and have a Level 0 prerequisite, such as the Fundamentals of Remote Sensing webinar. ARSET offers both online and onsite Level 1 and Level 2 training.

Level 2 training is more narrowly focused on a topic and/or at a more advanced level. Examples of training topics include generating land cover maps, estimating water basin budgets, tracking exceptional air quality events, or running computer code to read satellite data. An example of a recent ARSET level 2 training is “Creating and Using Normalized Difference Vegetation Index (NDVI) from Satellite Imagery.” This level of training is intended for end-users with moderate experience in remote sensing. ARSET requires prior participation in an ARSET Level-1 training or comparable training from another organization.

[Slide 12]

Invite attendees to take the poll on what type of trainings their program conducts.

[Slide 13]

(transition)

[Slide 14]

Onsite training is a face to face event in a physical location with internet access, and where each participant has their own computer. The training walks participants through the processes and analysis needed to use remote sensing data. The ideal number of attendees is between 25 and 50. The length of the training can be anywhere from days to even weeks. ARSET trainings are between 2-3 days for level 1 to 2-7 days for level 2.

The big difference between onsite and online training, as discussed earlier, is that during onsite training there is a large focus on exercises and hands-on activities where participants learn how to access and analyze remote sensing data. Lecture should be less than 50% of the speaking time. In addition, during onsite or face to face trainings, participants can get one on one attention. This is not possible during online trainings with hundreds of participants.

[Slide 15]

For a training to be effective, it must be driven by the stakeholders and end-users, and not by the organization that is conducting the training. As discussed in week 1, first you need to understand what the needs are, by conducting an end-user needs assessment.

Then you need to identify one or more stakeholders that are familiar with the community you are trying to reach and will collaborate by defining the agenda and focus of the training. They can also collaborate as trainers or participants.

Certain items need to be clearly defined and communicated to the potential participants ahead of time, and these include:

- learning objectives – what participants will learn and take away from the training
- learning prerequisites – for example, a level 2 training that requires a level 1 training

- and technical competency prerequisites – for example, onsite training may require that participants have technical competency with a particular type of software or type of analysis, such as GIS

[Slide 16]

Here are some other considerations for onsite training. The chances are that you have more people interested than space available for your training. For this reason, and to ensure that the training is successful, it's important to have participant selection criteria, and a process for selecting the participants. Define these criteria ahead of time. They might include technical competency (only participants who are already familiar with a type of remote sensing data or analysis) and whether the participants have a challenge that can be addressed by the training (this comes down to expectations, sometimes potential participants have a challenge that cannot be addressed through remote sensing).

It is very important not to overwhelm the audience with too much information. This can make it more difficult to meet the stated learning objectives. Make the agenda narrowly focused on a topic, and how remote sensing can help. For example land use, flood management, or air quality monitoring. For the internet in your training room, make sure ahead of time that it meets your needs. If it doesn't, make other arrangement such as downloading the data that participants will be working with ahead of time.

[Slide 17]

Invite the attendees to answer “in your experience, what are the most important elements that lead to a successful in-person training or class?”

[Slide 18]

Transition

[Slide 19]

We will now discuss the training structure. Here are some of the elements that we always include in ARSET trainings:

1. Begin with a lecture on satellite missions and instruments – although this may have already been covered in a prerequisite level 0 or level 1 training.
2. Demonstrate tools and other resources for access to remote sensing data.
3. Discuss and demonstrate analysis and application of remote sensing data to environmental questions.
4. Alternate lectures with hands-on activities (lectures are less than 50% of the time). This is better than, for example, having one day only with lectures, and then a second day only with hands-on activities.
5. Include case studies conducted individually and, if time allows, also in groups – we will discuss case studies in a few minutes
6. Make time for discussion at the end of the training. This is a great opportunity to get feedback from participants on their training experience, future training needs, and barriers to use of remote sensing data in their organization.
7. Disseminate surveys to assess the training. We will talk more about this later.

[Slide 20]

This is an example of an agenda used in a recent ARSET training for air quality monitoring applications. You can see that it starts with the fundamentals and does not jump immediately to the advanced topics. It then moves to data access (both a lecture and then an exercise on data access), later moving on to more advanced hands-on activities. You notice that lectures are not longer than about an hour each. The second day also has a mix of lectures and hands on activities. It's also important to have breaks, with a minimum of about three per day, one in the morning, an hour for lunch, and one in the afternoon.

[Slide 21]

[Slide 22]

(transition)

[Slide 23]

Exercises and case studies teach the use of web tools or software for access & analysis of NASA data. You can use exercises to introduce a topic, tool, dataset, or to emphasize a science or technical concept.

Exercises provide step by step instructions on data access and analysis, screenshots can be helpful. A case study (also called a 'use case' by some) is the application of remote sensing concepts or skills learned during a remote sensing training to a real world scenario. You can use pre-selected case studies, it's usually helpful to begin with these, but later on as participants become more skilled they should choose their own case studies, so they can practice what they learned to their specific problem of interest.

It is also very helpful to have participants present their findings to the rest of the class towards the end of the training segment.

[Slide 24]

Here is an example of an ARSET case study for a recent Level 2 training on Using NASA Remote Sensing data for Flood Monitoring and Management. You can find many of these examples on the ARSET webpage.

[Slide 25]

Including screenshots or images can be helpful, such as the one shown here for rainfall. This is the image that a participants should be able to obtain when following the instructions on this exercise.

[Slide 26]

Also ask questions. So based on the results from your exercise, what conclusions can you draw regarding flooding detection depth? This will help participants think critically about the results they obtained.

[Slide 27]

Finally, instructions should be very clear, don't assume any of the participants will be familiar with the tool.

[Slide 28] Speaker: Brock Blevins, ARSET Training Coordinator

In this following section, we will talk about the timelines and deliverables that can make an onsite, in-person training successful. Certainly given the many differences that can exist from one program to another, these timelines can adjust but what in the next few slides are what we at ARSET have found to work in order to ensure a smooth process, on time delivery of training materials, and a good working relationship with stakeholders and participants.

[Slide 29]

We have found that 6 to 12 months prior to an onsite training allows for enough time to sufficiently plan, produce, and deliver a training that can be tailored to the participant's remote sensing needs.

This can begin with the identification of the host institution. For ARSET, we conduct trainings for certain groups of stakeholders or for a particular community. Examples include such entities as the U.S. Environmental Protection Agency or the International Center for Hydroinformatics. If you train internally this could be simply determining who in the organization you will be training or the particular focus of the training. In essence, this will be a key partner and likely the host location of the training. The roles can be to sponsor, promote, or act as a boundary or stakeholder organization for the community of practitioners, decision makers, or policy makers you wish to reach.

4-6 months prior allows for time to develop a preliminary agenda and to use your or the host's network to not only gather interest for participants and to promote but to determine the end user needs of the community. Based off the needs you can begin to identify the remote sensing datasets and tools to instruct upon, determine the specific regional or thematic case studies to develop, and best refine the agenda WITH end users. This would also be the time to reach out to guest speakers if this is a collaborative effort as

well as advertise through your program's promotion methods to ensure there has been enough interest generated well before the training. You can think of this as an iterative process of hearing from the community and developing the agenda which is why a full 4-6 months is suggested.

3 months prior is a good time to follow up with agencies, organizations, end users, and potential participants. Personal contact and verbal communication is often what is needed if email alone did not secure interest in the training. It is a good idea to have a final version of the agenda in place by this point.

[Slide 30]

As we get closer to the actual training dates, 2 months out, a second round of outreach to advertise can occur or reminders sent. At this time, trainers should contact data centers hosting tools covered in the training to ensure there will be no site maintenance, planned downtime, or changes during the actual training dates.

1 month prior to the training, the final agenda is posted to your website, or the host institution's website. Some organizations or participants will not complete and finalize their travel arrangements unless they see a final agenda and the earlier that can be made available the better. Registration can be started at this point to get an idea of those who will attend.

This is also the time to have all presentations and exercises completed and sent for editing. If you are translating materials, be sure to give your translators plenty of time. The technical terms used in remote sensing are not always a straightforward translation and may take time to refer to scientific literature in those languages to be translated correctly. If you intend to conduct a survey after the training, this would be a good time to construct a list of all the tools and portals presented in exercises. This way they can be included in the survey ahead of time, and if possible given the last day of the training when they have just recently used the tools and are fresh in their minds.

We at ARSET have found that 3 weeks prior allows for ample time to practice the presentations to identify and gaps or holes in the presentations and get an idea of flow between topics. There is nothing wrong with extra practice. At this point and leading up to the training, registration is finalized, and the materials undergo a final round of editing, if necessary.

And just a bit on actions post training, in the weeks following, it would be beneficial to send out a reminder to complete the survey, if one was given, If you keep a database of participants, enter that information, and if you provide a certificate of completion, processing and sending those earlier rather than later is always appreciated.

Once again, this was an example of a time line that has worked well for us over the years when conducting onsite trainings. Variations will be dependent upon your capacity building program's focus, mission statement, and audience.

[Slide 31]

Invite attendees to answer “what additional things do you include in your timeline that we didn't discuss?” And “what tips would you like to share on things to avoid for an in-person training or class?”

[Slide 32]

(transition)

[Slide 33] Speaker: Ana Prados, ARSET Program Manager

The goal of program evaluation is to:

- Assess progress toward meeting learning objective – how well your program is doing?
- Assess the impact of the training – are participants making use of what they learn in their jobs or academic study and how?
- Altogether to provide an ongoing means of improving the program

Here are some commonly used tools

- Surveys – we will be asking you too, to complete a survey at the end of this training
- Interviews
- Focus groups

Note: these tools are also used to collect end-user needs (see week 1)

[Slide 34]

The first survey is sent immediately after the training, and the second is sent six months later. We also use interviews. Here is a sample of an ARSET survey, and some of the questions we typically ask.

[Slide 35]

The first survey is meant to assess learning objectives. So for example, if you expect participants to understand how satellite orbits work, or the advantages of using rainfall data, then you need to ask them a question to assess that.

You may also want to assess the instructors of the training for clarity, and pace of the presentation, and you may want to assess the training format. Was there enough time for discussion or demonstrations?

You may want to also gain more insight on how useful people found the topics that you taught, specific data types, satellite missions or even the software. This can be particularly important for planning your next training.

And speaking of your next training, it's never too early to start planning for the next one. This is an opportunity to ask about topics of interest. It can be either an open ended question, or a range of choices. As stated earlier, all of this is used to plan the next training, and it's actually an example of an end-user needs assessment.

And here are some tips:

- Disseminate online rather than on paper, it takes less time and makes it easier to analyze and share the results later

- Make time for attendees to complete it at the end of the training, rather than sending the survey later
- You do want to send reminders later, as this will help to improve the response rate
- Don't make it too long - people don't like long surveys - but it also needs to be long enough to make it useful to the trainer.

[Slide 36]

The second survey is specifically designed to assess the impact of the training. How did the participants integrate what they learned in their jobs, and how did it impact or improve their jobs? In the case of ARSET, we are specifically looking for the impact on participant decision-support activities, such as for example their ability to assess forest degradation or monitor floods. However, your program may have other goals so you may be assessing something different.

As in the first survey, we also want to assess the utility of the remote sensing data sets, portals or software that were presented during the training. This is also an opportunity to ask if they are still facing any barriers or challenges in using remote sensing resources, even after the training. This question in particular will be very useful for planning your next training.

Some of our tips are similar to those for the first survey. Disseminate online and send reminders, and don't make it too long

As you can probably infer from the last two slides, each training program needs to develop their own survey to meet their own needs. The goals of the ARSET program may not be the same as yours, so you will need to ask questions appropriate to your program, however these general guidelines should be useful for any training program.

[Slide 37]

Interviews were used early in the ARSET program. We needed to learn what were some of the barriers, and also needs. These interviews helped us frame the surveys. Now, we use them mostly to gather more detailed

information than we can get from the surveys alone, so we can gain further insight on the benefits of the training. And here is a quote from an ARSET program participant I interviewed: “NASA is doing the right thing, if you want people to use your data, you have to help them in how to do this – otherwise it is intimidating to use.”

[Slide 38]

Introduce the poll: “Which type of training evaluation methods do you employ?”

[Slide 39]

Transition

[Slide 40]

So to review, there are seven steps to a successful remote sensing training. This week we covered steps 5, 6, and 7 as they relate to onsite or face to face training.

[Slide 41]

This week we covered the following topics. Online versus onsite trainings and how to develop onsite trainings, including training levels (introductory to advanced), training structure, developing case studies and hands-on exercises, timelines, and program evaluation.

[Slide 42]

Next week we will discuss online trainings, training structure, how to develop assignments and exercises, training software, timelines, and deliverables.