

Tips for making effective presentations

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Presenting analysis and results is essential to any technological project, whether internal to your company or to the professional community, such as in professional society meetings, workshops, and consortium meetings. To be effective, the presentation must be convincing, straightforward, articulate, and supported with clear, easy-to-digest slides that convey the results credibly.

The crucial objective is to ensure that your audience understands your message clearly and completely. Accomplishing this, however, is not easy. Studies have shown repeatedly that an audience generally understands and remembers 25–30% of what they hear, but 60–75% of what they see. Noted exploration geophysicist Carl Savit often remarked that a presentation is successful if 20% of the audience gets 20% of your message. His words emphasize what you are up against when delivering presentations. In an SEG presentation, you only have about 20 minutes to summarize a year or more of research or study in a way that your audience can absorb. This is a daunting task unless you take great care in preparing and conveying your message.

Key to this effort is putting yourself in the shoes of your audience, who are hearing your story for the first time. Empathy for the audience is essential whether you are conveying your information in a written paper or in an oral presentation. Here, we offer suggestions to aid the clarity and effectiveness of oral presentations. We focus on two aspects: tips for the presentation style itself and tips on the quality and form of slides.

Start smart. First, avoid the tendency to tell every last neat thing you did in your project. Successful talks are usually those that convey not just results, but also ideas, concepts, and insights. Be concise. Focus on the main points, and emphasize that the details of the project are in the written paper, expanded abstract, or project report. Professional success often relies on your ability to stress the important points of presentations in the allotted time. When an audience assimilates your message, you gain credibility and respect. If you present your talk so that those who are not experts in the topic area can understand it, then not only will the non-experts appreciate and understand the talk, you will find that those with expertise will appreciate it as well.

Anxiety before a presentation—particularly if you are new to the process—is common. Relax: the audience is not judging you. They are there because they truly want to hear what you have to say and are interested in your message.

It's all right to be excited and enthusiastic—in fact, it's preferable! Some of the least interesting presentations are given by individuals who have been in front of an audience so often that they come across as disinterested. Keep in mind

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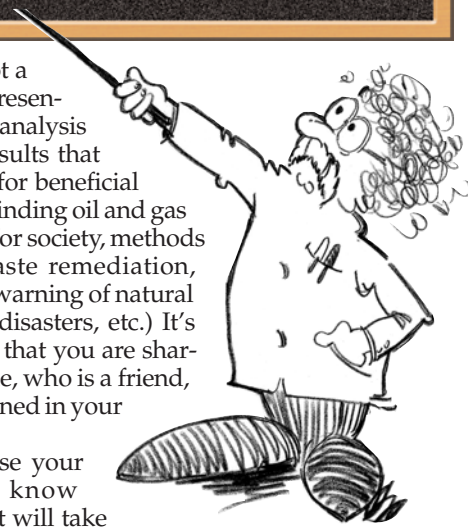
Presentations: Key points to remember

- Rehearse your talk with colleagues who can offer a detailed, constructive critique
- The purpose of a presentation is to convey ideas, concepts, and results, not how a project was conducted
- Explain complex ideas in simple terms
- Make sure your audience understands the key points
- Communicate directly with your audience. Make eye contact with at least one listener to gauge response and promote interaction
- For each slide, first describe what you are showing, then make observations and draw conclusions
- Speak at an appropriate pace—not too fast, not too slow
- Clearly list the assumptions and limitations of new technology and the costs of applying it
- End your talk with definitive conclusions
- Finish your talk within the allotted time and allow time for a question-and-answer period. Use this opportunity to clarify your message

that your talk is not a travelogue, but a presentation of scientific analysis with interesting results that have implications for beneficial applications (e.g., finding oil and gas to provide energy for society, methods for hazardous waste remediation, identification and warning of natural events to prevent disasters, etc.) It's helpful to imagine that you are sharing with a colleague, who is a friend, what you have learned in your project.

Always rehearse your talk so that you know exactly how long it will take and can deliver it clearly and concisely. Rehearsing also helps you polish your delivery. Ask a trusted colleague or two to watch your rehearsal and offer constructive criticism. It helps if your rehearsal audience is made up of individuals who are familiar with the material as well as those for whom the message is new.

Avoid using expressions such as “we next see,” “we see here that,” “next, I'll show you,” “then, I did.” They lack warmth and separate you from your audience. It is more effective to use straightforward, declarative sentences that invite your audience into the presentation. Ideally, you want your audience to think that they themselves have virtually come up with (or could come up with) the ideas you are conveying. This is not as strange as it might seem. Astute members of your audience who really get the thread of what you are presenting are also thinking ahead and drawing conclusions. That is when you have succeeded in capturing the attention of the audience.



As you give your presentation, communicate directly with your audience. It's helpful to make repeated eye contact with at least one member of the audience; choose someone who seems particularly interested in your talk. You can use his or her responses to your words as a means of interacting with the audience.

Speak directly to your audience, not to the screen. Glance at your slides only enough to ensure that you are aware of what is being projected; then turn to the audience so that they can hear you and you can maintain that all-important eye contact with them. Make sure you keep your presentation as a *talk* rather than allowing it to degenerate into an explanation of the slides. Starting with the introduction, invite your audience with gestures and your tone of voice to participate in the presentation with you. Draw them into your presentation, and they will be focused with fascination on your every word.

Speak at an appropriate pace during your talk. Most people do not hear and absorb as fast as a rapid speaker talks, particularly now when the geoscience community is global and many members have different first languages. Relax, slow down, speak clearly, and communicate. On the other hand, do not speak so slowly that the audience gets bored and tunes out. Use your voice for emphasis, varying the volume and the speed of your delivery. For the essential points, raise your voice, slow down, and pause afterward to let the message sink in.

It's a story. Think of your talk as a story, complete with chapters. Imagine your story as a mountain range, associating the importance of the key points with the height of the mountains. Make sure your audience really understands the single highest peak, i.e., the main point. Then, make sure they get each of the other key points in turn. In Colorado, Mt. Elbert would be first, then the two or three next highest "fourteeners" (mountains with 14 000+ ft elevation) and so on, without getting down to the 13 000-ft peaks.

All presenters accidentally leave something out that they intended to say in a talk. By focusing on the "high peaks," you ensure your audience will get the essential points—those that you really want them to grasp. As long as the audience understands these, it won't matter that other items were left unsaid.

Remember, you're *telling* a story—not writing one. Therefore, avoid using intricate, carefully crafted sentences as in written text. Recognize that in friendly speech, we do not typically speak in sentences, but in short phrases that convey the message concisely.

Slides—general guidelines. In recent years, PowerPoint and similar tools have revolutionized presentations, and it is easy to assume that the quality of slides and presentations has greatly improved. To the contrary, the general quality of both has suffered, perhaps in large part because of the ready availability of these tools. It is so quick and easy to enter lots of words and pictures into slides that the message is buried. Slides with too much detail overwhelm the listener and confuse the main point. It bears repeating: show only those slides that most effectively communicate your points (*Figure 1—No* and *Figure 1—Yes*.)

However, the medium is *not* the message. *Visual aids should help, not dominate, the presentation.* Consider two extremes for slide presentations—a presentation with no slides and one with so many slides that the speaker could never realistically get through them all.

Conclusions

- Attenuation and velocity anisotropy are related because they may coexist in subsurface rocks where systems of aligned fractures or pores, interbedding of thin attenuative layers, scattering, and stress-induced phenomena are present.
- Attenuation anisotropy is more significant than velocity anisotropy. Whereas significant velocity anisotropy can be about 20%, attenuation anisotropy is often several hundred percent.
- Following the idea of Thomsen's notation for velocity anisotropy, we introduced a set of attenuation anisotropy parameters called ϵ_0 , δ_0 , and γ_0 . The parameters ϵ_0 and γ_0 quantify the fractional difference between the horizontal and vertical attenuation coefficients of P- and SH-waves, respectively, while δ_0 is defined through the normalized second derivative of the P-wave attenuation coefficient in the symmetry direction.
- The attenuation coefficient can be used as an attribute for the detection of fractures and the prediction of fluid properties from seismic data.
- One must correct for attenuation in anisotropic media before doing AVO analyses because it can significantly influence the body-wave amplitude.

Figure 1—No. Complete and lengthy sentences include unnecessary details and force the use of too-small fonts.

Conclusions

- Attenuation and velocity anisotropy related
- Attenuation anisotropy more significant
- Thomsen-style attenuation-anisotropy parameters
- Attenuation coefficient as fracture-detection attribute
- Correction for attenuation in AVO

Figure 1—Yes. The conclusions are shown with succinctly worded bullets.



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Slides:

- Slides are your prompt about what to say to the audience
- Keep slides simple
- Communicate one idea per slide
- Keep content sparse, and never use the word "the" on a slide
- A dark background with light-colored text or drawings works best visually
- Use a bulleted format for outline slides
- Repeat the outline slide at key points throughout the talk to remind the audience of where you are in the talk
- Graphic slides should contain only enough information to convey the message, with arrows, boxes, etc., that direct the audiences' attention to key points

Outline

- Motivation and assumptions
- Transversely isotropic (TI) attenuation
 - attenuation-anisotropy parameters
 - plane-wave attenuation coefficients
- Physical-modeling experiment
- Effective attenuation anisotropy
- Applications in VSP/reflection seismics

Figure 2—Yes. A succinctly worded outline listing major portions of a talk.

Wombat Geophysical Company

data



Figure 3—No, never. This exaggerated slide clearly overdoes the logo and reduces the data to an unreadable size.

The best approach is to aim for just enough slides to support your message. Show only those slides that most effectively communicate your points and no more. Slides are visual aids that augment the talk—they are not the full report. Use them to communicate the main ideas of the presentation and to help you, the speaker, flow smoothly through the talk by prompting you for what needs to be communicated (Figure 2).

Slide presentations often contain the logo of the presenter's organization on every slide. We consider the logo to be space-consuming noninformation. After all, the speaker's organization was listed in the program and given by the session chairman. A prime example of how not to compose the content of a slide is given in Figure 3. This classic tongue-in-cheek slide (courtesy of Les Hatton) from a couple of decades ago takes the all-too-frequent practice of showing logos to an extreme, minimizing the area available for the content on the slide. Certainly, if you must use a logo on every slide, make sure that it is small and not ostentatious.

Most often, the message in a geophysical presentation is best conveyed by showing data. Figure 4-No is an example of how not to present data in a slide. The photo inserted in the upper left gives a graphic example of an earthquake victim that can elicit pathos in the audience. In a geophysical presentation, however, pathos isn't the point. This graphic is a diversion from the message contained in the data and will

likely draw the audience, even if momentarily, away from the data and dilute the message.

Additionally, it is not possible to read the information contained in the curve and bar graph, even for those at the front. The data figure in the slide is just too tiny. Figure 4-Yes shows all that needs to be conveyed. Note that just the bar graph completely fills the screen. The curve shown in Figure 4-No (whatever it shows since we cannot read it) is immaterial. Note also that the title in Figure 4-Yes is not only briefer than that in Figure 4-No, it is much more to the point. Since the word "casualties" by definition includes those injured, it is an inappropriate title for the bar graph, which specifically lists only loss of life in a number of devastating earthquakes.

Compare the information contained in the simple presentation in Figure 4-Yes with that in the highly graphic Figure 4-No, with its picturesque, but content-free background.

Ensure that similar data shown on different slides are displayed with the same scale so that the audience immediately grasps the significance of variations in the data shown or compared in different slides.

Figure 5-No takes the insertion of gratuitous, entertaining, and distracting pictures to an extreme, in addition to offering a title that says little about what the numbers mean. How cute that a chimpanzee can be taught to smoke! Any contemplation of that fact will detract the audience's attention away from the message.

Then, there is the diagram depicting the progress of influenza in a body's system. This is fascinating material in a talk about influenza, but distracting for a presentation on earthquake hazards. Also, the font is much too small. With the unnecessary photographs removed, Figure 5-Yes shows all the pertinent data, in large lettering and in descending order of relative risk. The title of the slide indicates explicitly what the numbers mean. The figure, moreover, allows sufficient room to show in a readable form the source of the data. On another note about this slide, the risk factors might be more effectively shown as a bar or line graph. The relative risks would then jump off the page visually for the audience.

Figure 6 compares two slides—one with too much detail (Figure 6-No) and one (Figure 6-Yes) that contains enough information to engage the audience rather than diverting their attention to determining what the slide means. Both slides contain the essential information. The title informs the audience at a glance what the data represent. They see it and hear you say it, and remember it. We took Figure 6-No and improved it for simplicity, clarity, and interpretability. Note the following differences between the two figures:

- 1) An informative slide title has been introduced to tell the audience at a glance what the slide is conveying
- 2) The velocity plot has been removed
- 3) The distance annotation, which is too small, has been removed and replaced by a more readable scale bar, and
- 4) Critically helpful annotations ("Plan View," "Profile," "Monitor Well," and "Clearwater Reservoir Sand") and the key point of the slide ("yields tighter clusters") have been inserted with acceptable font sizes.
- 5) The velocity plot, which represents an independent idea, has been moved from this slide (Figure 6-No) to a later one (not shown here) as a standalone idea. In doing so, it can be enlarged sufficiently so that the audience can see the differences in the two velocity curves.

These enhancements result in two simple slides rather than one complicated one. As a result, the data in Figure 6-

Yes actually occupy more real estate than in Figure 6-No, allowing the speaker to convey the message more effectively. The annotations identify key points that the speaker needs to cover and greatly aid understanding at a glance. Now, the speaker has no need for a laser pointer. There is even room for the key conclusion (the new event relocation technique yields tighter clusters).

Text slides. Word slides should be used no more than necessary. Use them to help the audience follow where you are in the talk. They also are good for prompting, which helps you to stay relaxed and emphasize the key points.

Moreover, the content of a word slide should be sparse (i.e., just a few key words in bullet points, as in the conclusion slide shown in Figure 1-Yes). Wordy slides, such as that in Figure 1-No, only encourage the audience into a reading exercise, diverting its attention away from where it should be addressed—listening to you.

Except when you are displaying data and concepts in graphics, your audience should be focused on you, listening to your words and registering the added emphasis conveyed through your facial and body language. Surprisingly, even in a large auditorium, audiences can see and benefit from gestures, which can be a useful visual aid for explaining ideas. The audience is there to hear what you have to say; they also benefit from how you say it. If the audience is forced to read wordy text while you are speaking, it “divides” their attention to the extent that they will miss the entire message.

Word slides should have a common font and size, although it’s preferable to use a slightly larger font for the title. The font size should be large enough for those in the back of the audience to read with ease. This holds independent of the size and shape of the room. Do not count on font size xx always being right for your slide. Because letter size in a slide scales with the size of screen, we recommend setting the font size as a given fraction of the height of the slide. In our experience, a good rule is to make the height of lower-case letters (such as the letter “a”) 1/25 the height of the slide. (As we have aged

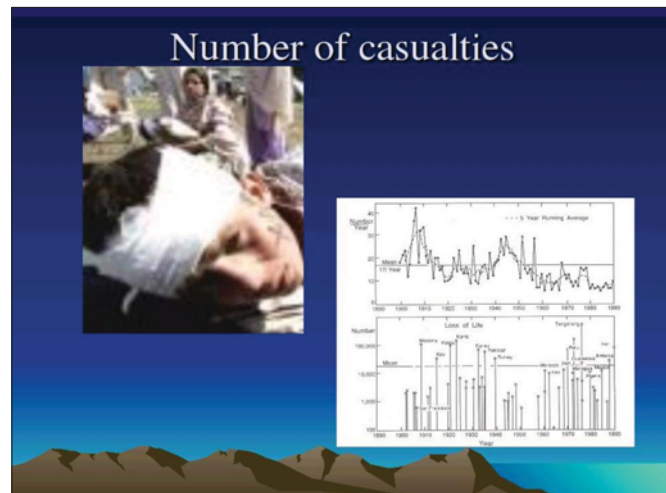


Figure 4-No. Gratuitous photo with distracting pathos and illegible data.

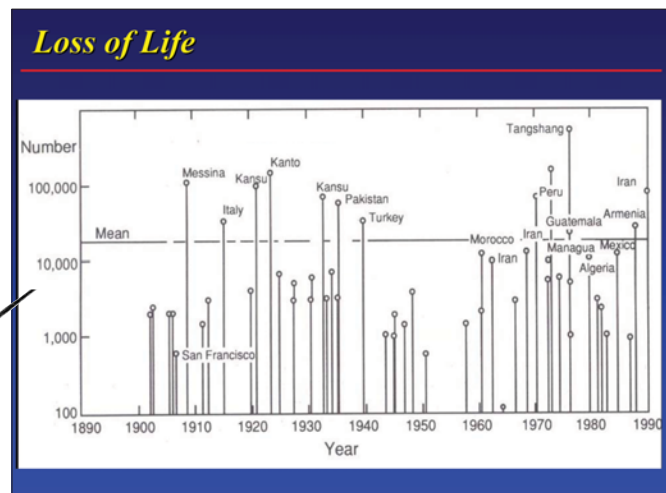


Figure 4-Yes. All the data needed.

Aa Bb Cc Dd Ee Ff Gg Hh Ii Jj Kk Ll Mm Nn Oo Pp Qq Rr Ss Tt Uu Vv Ww Xx Yy Zz

You probably can read

the words on Figure 4-Yes with no trouble, but that is because you are reading it close-up on a printed page. However, the lettering in even this high-quality slide is far too tiny for an audience to read. We’ve made recommendations for font size, but also comment here on how a slide such as Figure 4, with its small lettering, can be presented acceptably during a presentation. This figure was taken from a published paper, and the speaker has two choices for presenting the material. One is to show the figure as published (in which the speaker should acknowledge the source, preferably on the figure, but at least verbally). In this case, the speaker should also acknowledge that the audience may have difficulty reading the content of the slide and then help the audience by explaining the data verbally. For example, for this slide the speaker could mention that the abscissa ranges from years 1890 through 1990 and the ordinate is logarithmic, going from 100 deaths at the bottom to 100,000 toward the top. The speaker might also help the audience by pointing out the relatively small loss of life for the San Francisco earthquake of 1906 relative to the huge loss in the Tangshang, China, earthquake of 1977.

The second choice for presentation is to redraft the slide so that it shows just a subset of the number of earthquakes, with bolder lines and larger lettering. Your audience will appreciate not having eye-strain by the end of your presentation. Think of the listeners at the back of the room. Aim for this group to be able to read your figures with ease, which will ensure that those closer to the front will have the pleasure of clearly readable figures.

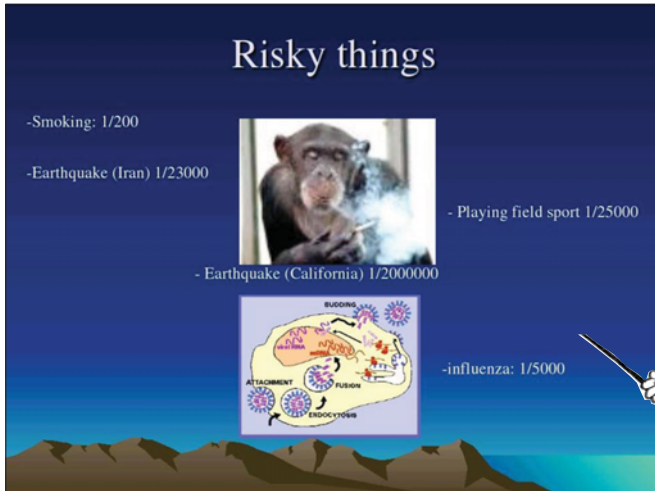


Figure 5– No. Photos divert the attention of the audience from the message, as do the meaningless title and minuscule font size with unitless numbers.



Figure 5–Yes. The words in larger font succinctly encompass the message in a slide with an informative title.

and our eyesight has degraded, that 1/25 rule has changed to 1/20 and is heading toward 1/15.) Use bold-face fonts, as appropriate, so that letters are easy to read.

Talks can sometimes benefit from the use of an outline slide. An outline slide tells the audience what you are going to say, what you are saying, and then what you have said. By observing where your talk is heading, the audience will be better able to follow the presentation. Figure 2 illustrates an outline slide.

Too often, the first item in an outline slide is “Introduction” and the last one is “Conclusions.” These words are uninformative. Instead, the first point in the outline could be more explicitly stated, for example, “Motivation and Assumptions” or “Theory” or “Summary of Previous Studies.” The last item might be “Summary and Way Ahead,” for example. The outline should list what is unique to your presentation. Avoid including too many entries and making the font size too small.

It can be helpful to repeat the outline slide at appropriate places in the talk, highlighting the specific topic that you will cover next. This can help focus the audience on where you are taking them with your presentation. This is also a good place to pause in your story and allow the audience to digest your message. Explain what is coming next before springing the next slide on them.

Your bulleted slides should consist of key eye-catching words. A good start at simplifying them is to remove most, if not all, of the articles (“a”, “the”) and most of the verbs. We suggest never using the word “the” on a slide, and almost never the words “a” or “an.”

PowerPoint etiquette and delivery. To date, PowerPoint presentations are most often single-screen, so, for example, the benefit of doing before-and-after comparisons across two screens is unavailable. The electronic presentation, however, offers the opportunity for easily toggling back and forth between figures. Occasionally, you might wish to return to a figure presented several figures back. For this, it is best not to click backward through the figures, but rather to repeat that figure at another place in the arrangement of figures so that you continually advance forward through the slides.



If, in the future, PowerPoint presentations can be conveniently done with two screens, do some orchestrating of slides on the left and right screens. It is less confusing for the speaker and makes for a smoother presentation when both screens are advanced at the same time. If you

wish to hold a figure on one screen while advancing the one on the other screen, repeat that slide in your arrangement. Blank slides can aid the presentation when nothing needs to be shown at a given point while you are speaking. Leaving a slide up after describing it diverts the attention of the listener. For “before” and “after” comparisons, put the “before” slide on the left screen and the “after” slide on the right screen. You can also take advantage of the extra real estate by using the left screen to capture the key points in a few words and the right screen to show the graphics.

Keep it simple. A slide should not overwhelm the audience with detail. Slides are there to *augment* your talk so that the audience follows and remembers more of what you say. If you must illustrate all of the points contained in such a slide, then break it up, putting the content into several simple slides. Not only are simple messages in slides individually beneficial to the audience, they help to simplify the entire story embodied by the presentation. This helps you to move smoothly through the storyline.

In particular, communicate just one key idea per slide. This helps your audience to follow your message. The use of sufficiently large lettering is especially helpful toward this end because it inherently minimizes the quantity of material that can be squeezed into a slide. The simpler the slides, the clearer, easier, and more straightforward is the talk. The clearer the talk, the greater the chance that a higher percentage of the audience will receive and understand the message. If the audience has to strain to see and interpret the message in your slides, it will be distracted from hearing the one coming from your lips.

Using a dark background with light-colored text or lines is easy on the viewer’s eyes. Dark lettering on a light or white background sometimes might appear clearer, but use only as much light space as necessary on the slide for the graphics to fit. Never use graphics or dark-colored fonts against a dark background (e.g., red text with blue background). The material will be unreadable. Not only does this strain your audience’s eyes, it also dilutes the message. Light blue lettering and lines on a dark blue background also are unacceptable. We have seen presentations in which the speaker, while squinting to read his own slide, says “some of you might have trouble reading this slide.”

For both graphics slides and word slides, give thought to

aesthetics in the arrangement of the material, in particular margins and spacing of the content. Margins be should neither too small nor too large. Besides compromising the aesthetics, margins that are too large reduce the area available for the content.

Being a story, your presentation will naturally consist of parts that can be considered as chapters. Just as an extra blank page is often inserted prior to the start of each “chapter” in a book, it can aid your presentation if you add a slight pause prior to continuing on to the next chapter.

When you display a slide, first describe what you are showing before discussing the interpretation. Since your talk is a story, it is more effective to say a few words about what is coming in that slide rather than bringing up the new slide before starting to talk about it. You want to ensure the audience understands the slide before you start making observations and drawing conclusions. Explain the axes of cross-plots and histograms, including scales and units. Tell the audience the coordinate system and scales for maps and cross sections. Also, it is good to point out links between associated plots, for example a profile line A-A’ drawn on a map that depicts a cross section that will follow in the next slide.

Laser pointers: An unnecessary evil. Leave your laser pointer at home. Ideally, you shouldn’t need one. On graphics slides, use of highlighting (e.g., arrows, ovals, boxes) on a slide best illustrates the exact locations of interest in the figure. Thoughtful highlighting reduces or even eliminates the need for a laser pointer, particularly the recent bright green ones that wash out much of the screen and are harsh on the audience’s eyes. Laser pointers are needless for word slides. Audience are perfectly capable of reading an appropriately constructed word slide without having to follow the bouncing ball.

Finally, ensure that your slides are free of grammatical and typographical errors. Ask those who attend your rehearsals to help spot such errors.

Final analysis. When your topic involves new technology, always clearly list the assumptions that you used in your research and the limitations imposed by those assumptions (i.e., over what range for the key parameters the technology is applicable). Also, let the audience know how the cost of applying this new technology compares with alternatives. In addition to providing all of the advantages of this great new methodology, also talk about the disadvantages, unresolved issues, and other sticking points to its application. The scientific method that we all have been taught relies on testing various hypotheses. Some of these hypotheses are valid and generate reasonable results. Most will have limitations and cause the methodology to break under certain circumstances. In your research, try to break your great new idea, and tell your audience about shortcomings that you have discovered. They will appreciate this and value your thoroughness and candor as well.

Strong presentations will have definitive, carefully thought out conclusions, whether they are offered verbally or in a conclusions slide. A simple and concise conclusion will follow naturally; support it with well-presented, convincing arguments and data from your talk. This holds whether you have successfully reached an end of the project, or your paper is part of an ongoing study and has reached a plateau, and holds whether the findings are positive or not.

Always allot time at the end of your presentation for questions and answers. This time is often the most lively and valu-

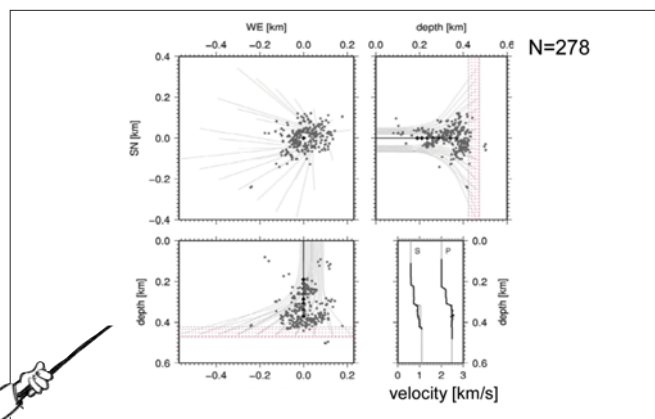
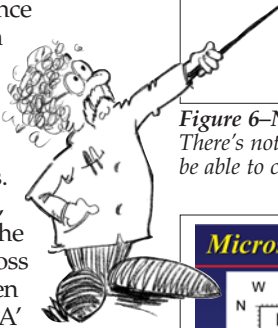


Figure 6–No. This slide has the essential information, but that’s it. There’s not enough identifying information and the audience may not be able to connect the visual presentation with the verbal one.

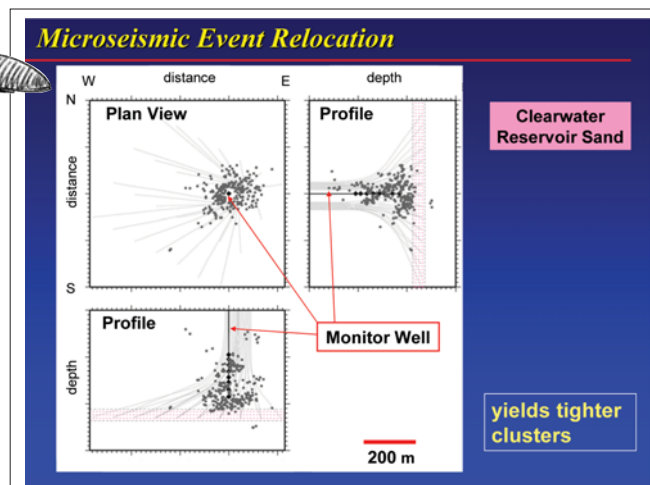


Figure 6–Yes. The addition of a title and appropriate annotations and labels help the speaker convey the message clearly.

able part of the talk because it is the most interactive. The Q&A period provides time for you to clarify your points and ensure that the audience gets your message. It also gives you the chance to receive valuable feedback for your work. You have an opportunity to learn something from the audience that you could potentially use to solve a sticky problem.

Presentations that effectively convey the results from a scientific project require a clear, concise, well-articulated talk supported by crisp, clear, easy-to-digest slides. Above all, empathize with your audience, and take care to help them grasp your message fully. We hope the guidance offered here can be of significant help toward this goal. Not only will the audience benefit from your ability to convey complex ideas in simple terms, your reputation for conveying ideas will be enhanced. As a result, your peers will be inspired to seek you out to share their ideas with you. Good luck with your talks!

TJE

Acknowledgments: Roel Snieder kindly provided Figures 4–5 from a spoof presentation “Earthquake Hazard: A Political Problem?” to students at the Colorado School of Mines that demonstrates how not to give a presentation and offers a better alternative for the presentation. We thank Les Hatton for allowing us to use his wacky Wombat figure, and Yaping Zhu for his “Conclusions” slide. Members of the ExxonMobil staff are already using some of these tips to yield improvements in their presentations.

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