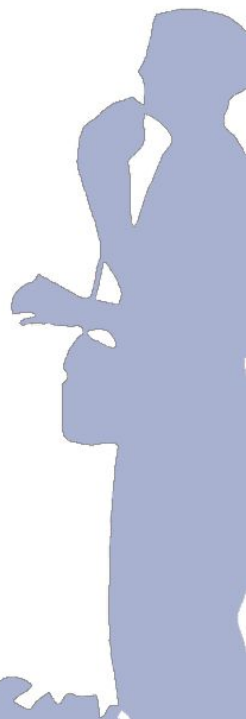
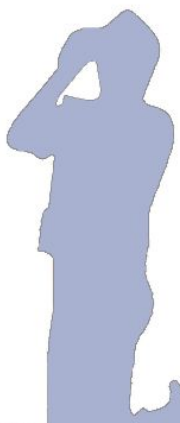




# Tips in Words and Drawings 2

Collaborating with scientists in National Parks



Martha Merson, Principal Investigator and Project Director, TERC  
Louise Allen, Principal Investigator, Colorado State University  
Nickolay Hristov, Principal Investigator, TERC  
Chris Tullar, Project Illustrator

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# Rewarding But Rare

Consider featuring a scientific study

Amazing science happens in and around parks, Yet the stories, the characters leading and contributing to the studies, and their struggles are rarely well-known.

Let's commit to increasing interactions among rangers and scientists *and* to increasing the public's appetite for science with fresh and relevant stories.

After observing how scientists reacted to requests to make their research prominent for visitors, we compiled and illustrated our insights as 10 tips. (For a companion guide with tips targeted to scientists who are keen to work with rangers, check the link below for [Tips in Words and Drawings 1: Launching Collaborations](#).)

We hope our hard-won experience enables you to be more effective at opening lines of communication and finding new possibilities for collaboration.

Read more about iSWOOP on p. 13. Also check out [www.terc.com/iswoop](http://www.terc.com/iswoop) for additional resources on featuring science in parks.



The tips we offer are based on recent experience in a variety of parks and on findings from a survey of scientists with active permits.

# Seek Out the Latest Science

let visitors' curiosity be your guide

Search on [irma.nps.gov](http://irma.nps.gov) for annual reports filed at your park in recent years. When skimming the list of environmental studies, note scientists whose focus overlaps with questions visitors are curious about.

Identify a scientist and start a conversation to learn more about their methods and experiences collecting data.



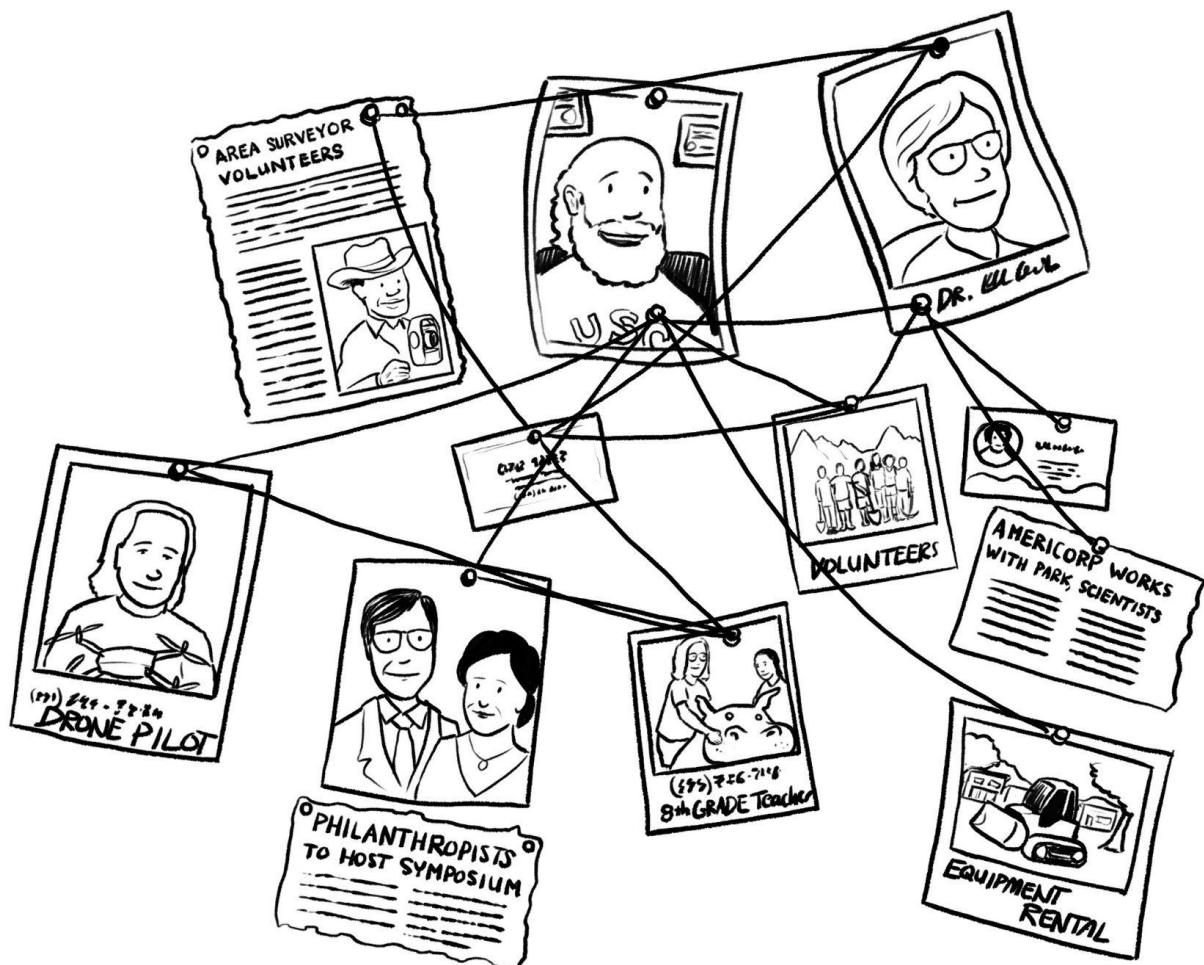
*Make a short list of a few scientists to contact.*

# Back at Ya

make me a perfect match

Scientists typically love the places they have collected data and want to give back. Many live to inspire others. Your role as a matchmaker, connecting scientists to interested teachers, volunteers, or others is invaluable. Scientists we have spoken to have had similar positive experiences in the past that you can build on. Ask about them and base your requests on what worked in the past (in terms of communication, timelines and expectations).

*Scientists love their park hosts and want to give back. Rangers can help them figure out how.*



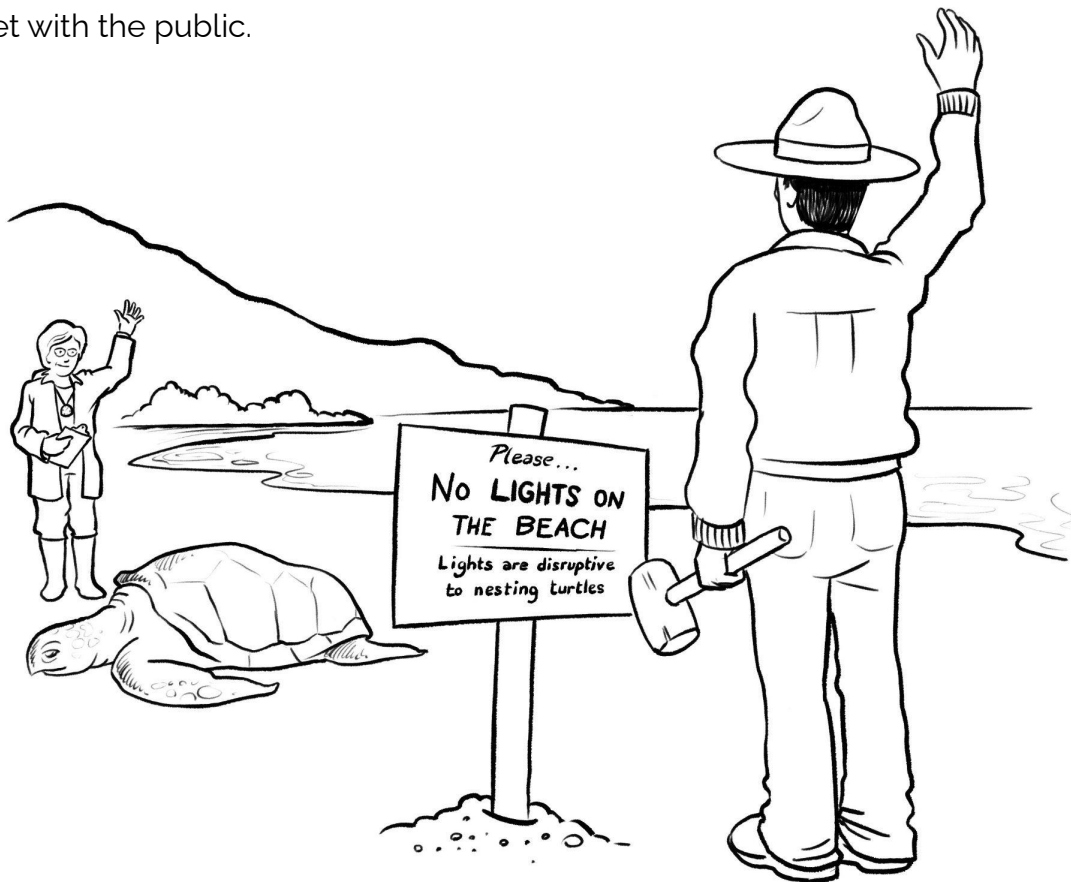
## Lead with Influencing Policy

this work really matters (flattery for scientists)

If you need to tempt scientists to engage, offer the opportunity to influence policy. Research managers may have plans to apply scientists' findings. Ask if there are plans to introduce new conservation approaches to visitors and find out how the public will be informed.

Let selected scientist(s) know you'd like their help. Especially if the topic is contentious like a prescribed burn, scientists can fill in gaps and join conversations with interpreters and others with communications expertise to prepare for or even meet with the public.

Volunteers, Friends' group members, other scientists, and research managers can talk through ways to educate the public and facilitate dialogue.



*It's a win-win when scientists can influence policy and help park staff accomplish their mission.*

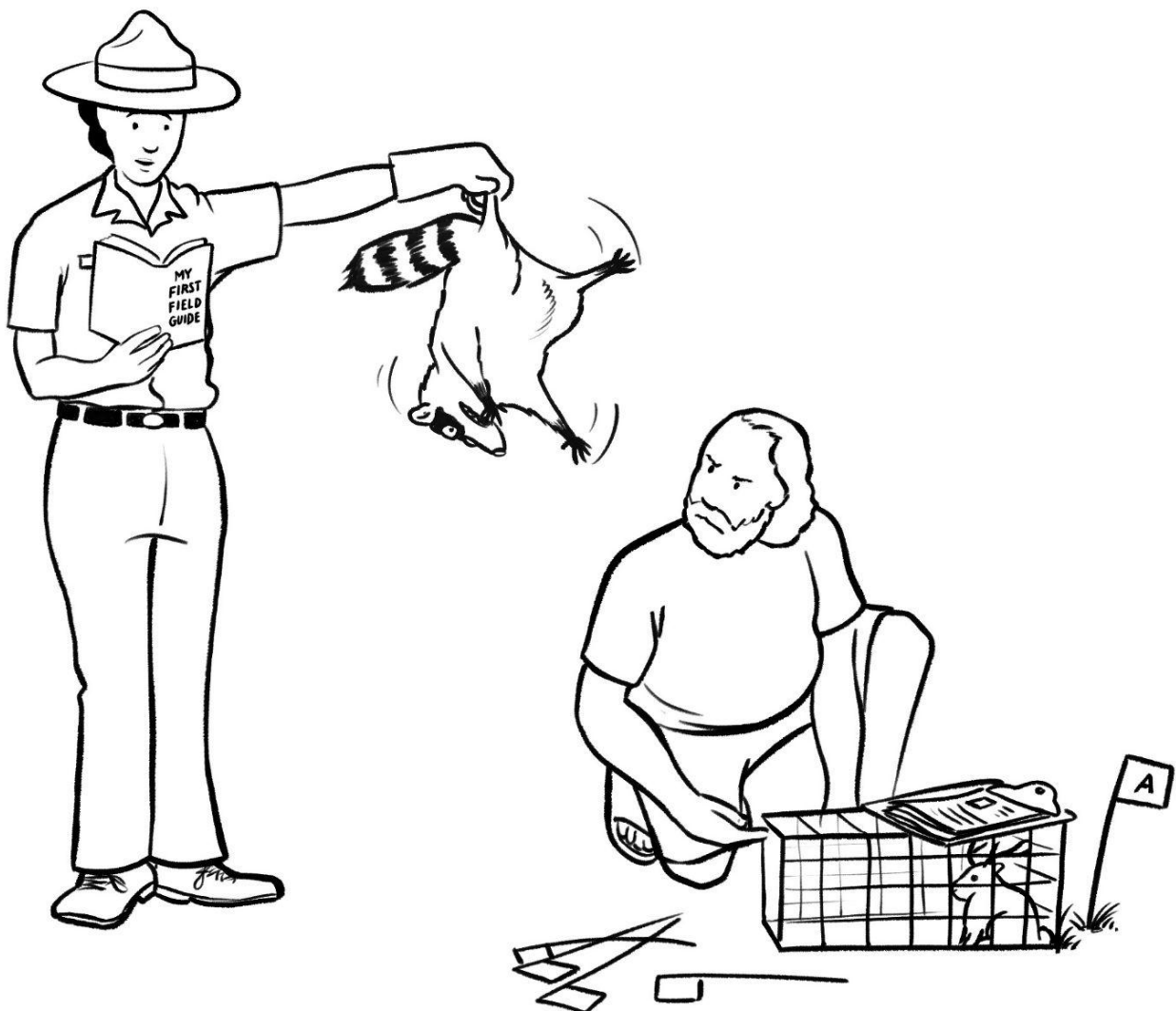
## Treat Time Like Currency

it's obvious (maybe)

Direct questions to scientists that are a match for their expertise. Ask a peer before you approach a scientist to confirm that your question warrants getting a scientist involved.

Maybe the puzzle can be solved with a little independent research.

Scientists can be exceptionally generous with their time, but know that time answering your questions is time they aren't working on their research, prepping for teaching, or being with family. Be mindful as you reach out with requests: does your question require the scientist's expertise?.



*Consider whether your request is a match for the scientist's expertise.*

## Don't Give Up

in the face of silence

If your effort to connect is met with silence, don't give up. Check the research permit for names of co-investigators and email them. Grad students may have more time to talk and a fresh perspective on the study in progress..

Or try catching up with the researchers in person. The permit should list where and when the researchers will be collecting data. Resource managers will know if the researchers have reserved park housing. Leave a note on the door or on their vehicles.



*When email and phone calls fail to get a response, get creative.*



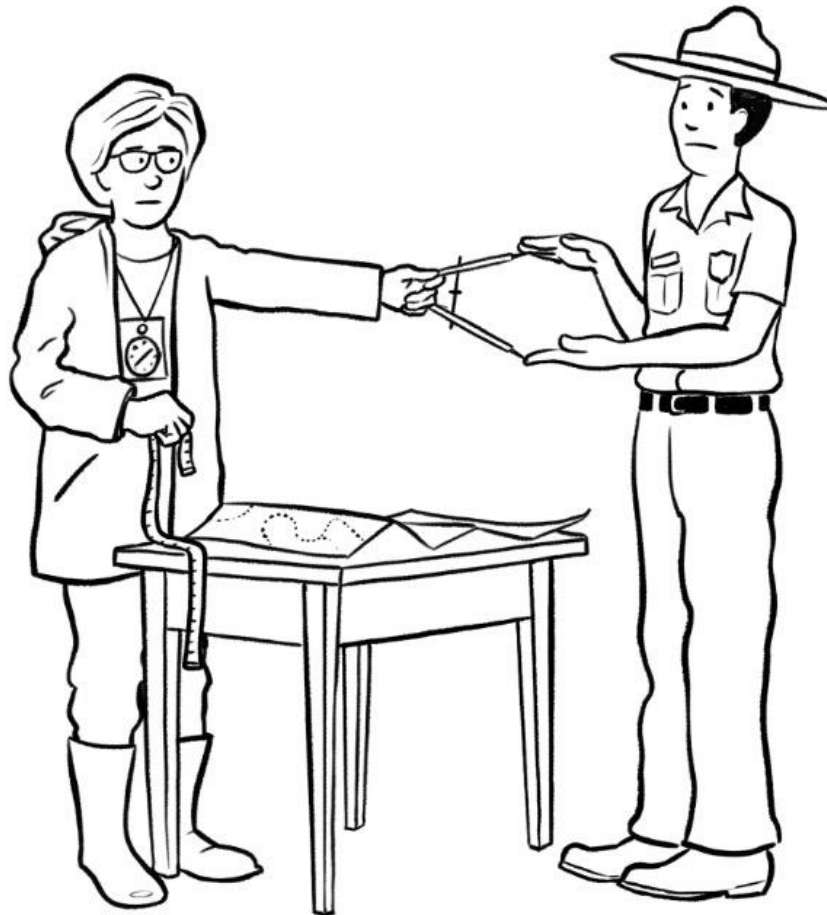
# Speak the Language of Precision

about yay big

Scientists are trained to care about accuracy. They use metric units like meters and micrograms. Be ready to converse in the units they use.

On the other hand, if scientists can't give an informed, precise answer, they may hedge. They know all too well that science changes, findings are revised and refined, and their credibility can be damaged if they make a claim they can't back up.

Brainstorm examples that are of similar size. Use scale to make comparisons memorable. "That's like eating 200 Big Macs an hour."



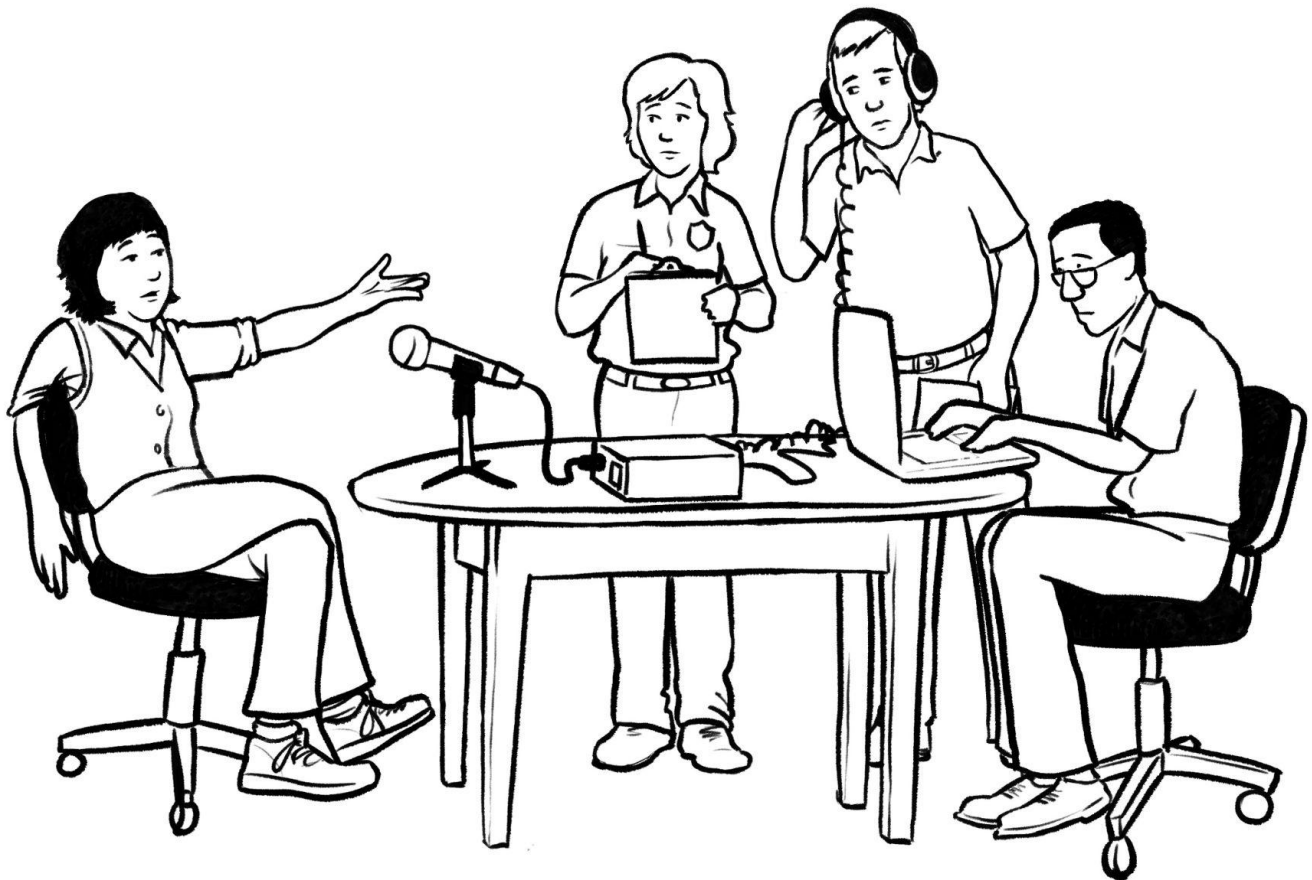
Be ready to use and convert units like meters, micrograms, degrees Celsius to describe how far, how toxic, and how hot.

## Say It Back

“in other words”

To benefit from an interaction with a scientist, become familiar with their methods in advance. Since published articles may be written with technical language or available only for a fee, start with a recent annual report filed on [irma.nps.gov](http://irma.nps.gov). Or seek out a write-up from the scientist's home organization (such as a newsletter or website).

Invite colleagues or volunteers with related expertise to the meeting so you can later confer and piece together anything that didn't make sense.



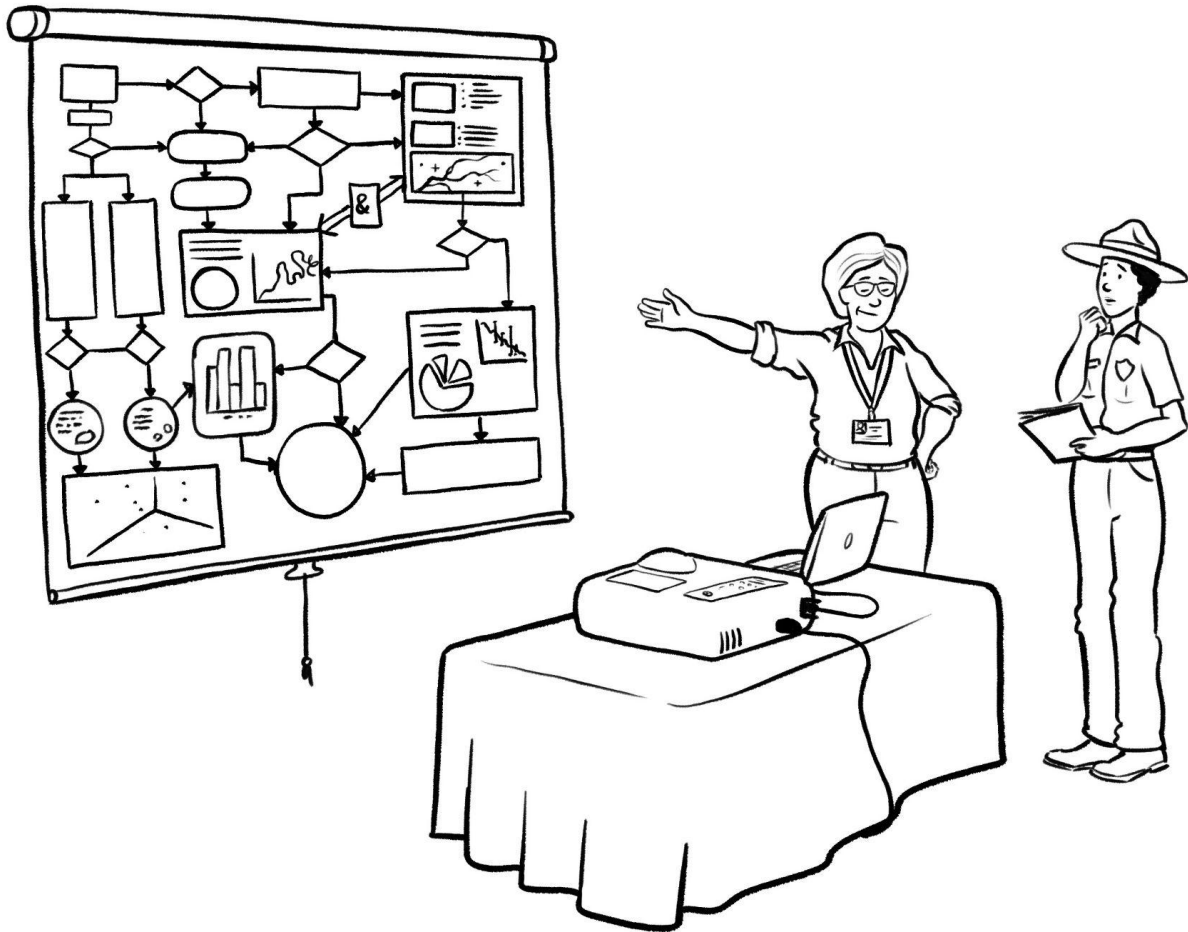
*Take notes, then tell the science story back to the scientist to confirm that you have the details right.*

# Make It Mutual

share your ideas to make the message clearer

Interpretive rangers experienced in communicating with a wide range of public audiences can offer feedback on scientists' slides or talking points. Then scientists will likely make their presentation even better in the future.

Scientists often design complex figures for presentations to peers. Show them how to simplify a figure by beginning with a simple trend line. On subsequent slides they can add information. That way, they can build a sequence that brings the audience along. A sequence both builds understanding and increases suspense.

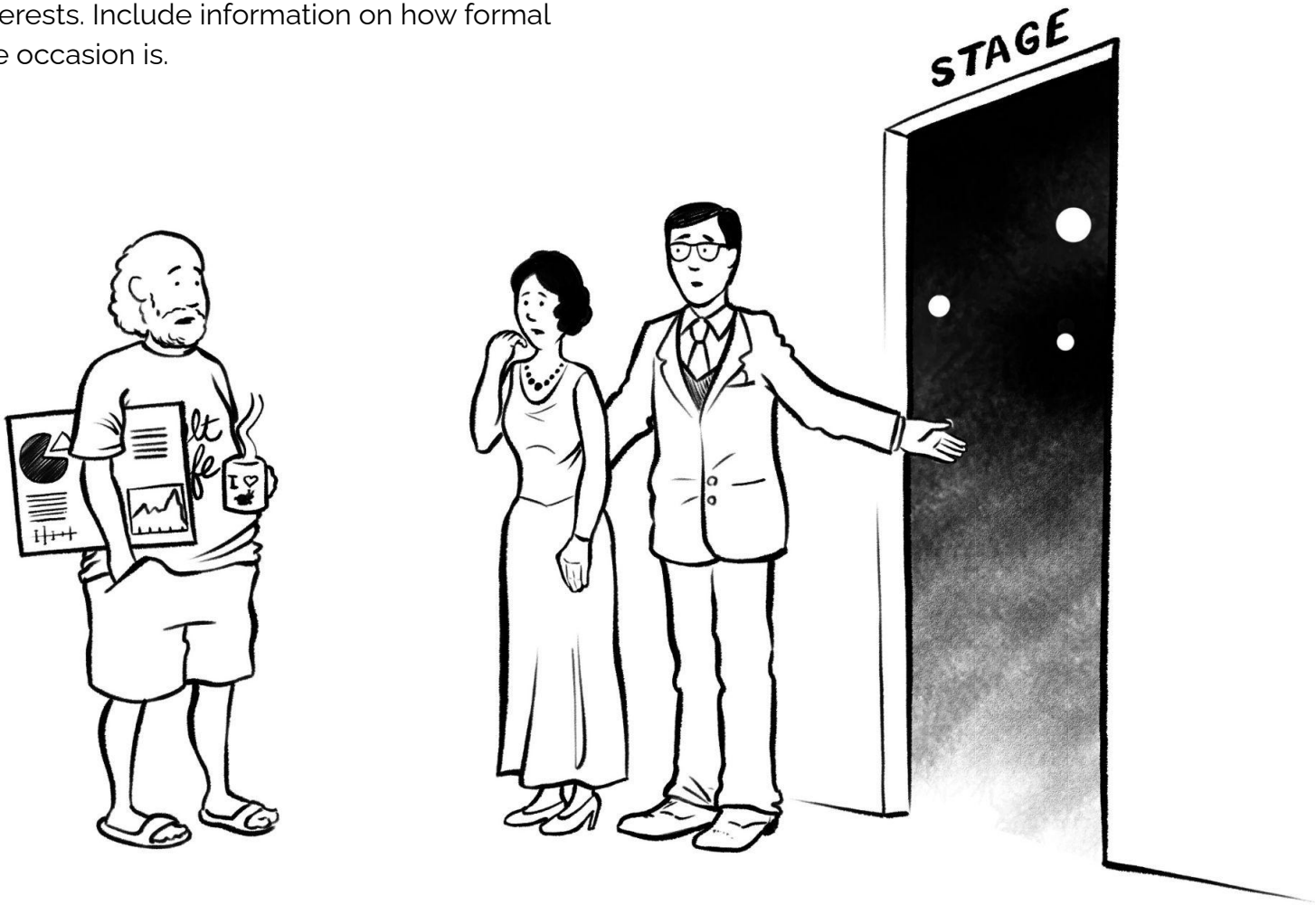


*Scientists can benefit from suggestions for visually simplifying their ideas.*

## Provide More Information

more is more

When planning an outreach event with a scientist, give more information about the setup and the audience, not less. If you are expecting a scientist to present to a group, don't be shy about setting up a time for a run-through and/or a deep conversation about the goals, the audience's prior knowledge, interests. Include information on how formal the occasion is.



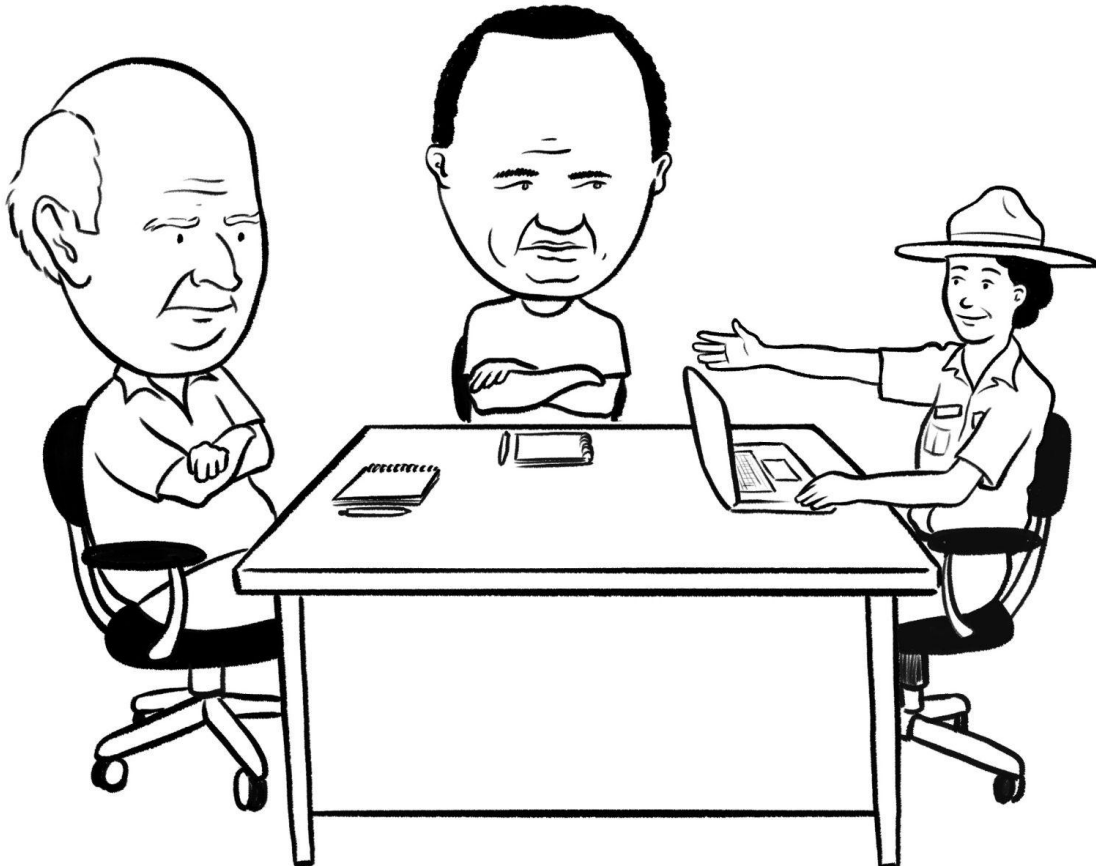
*Set up a time for a run-through so everyone has the same expectations for the event.*

# Make Room for Big Egos

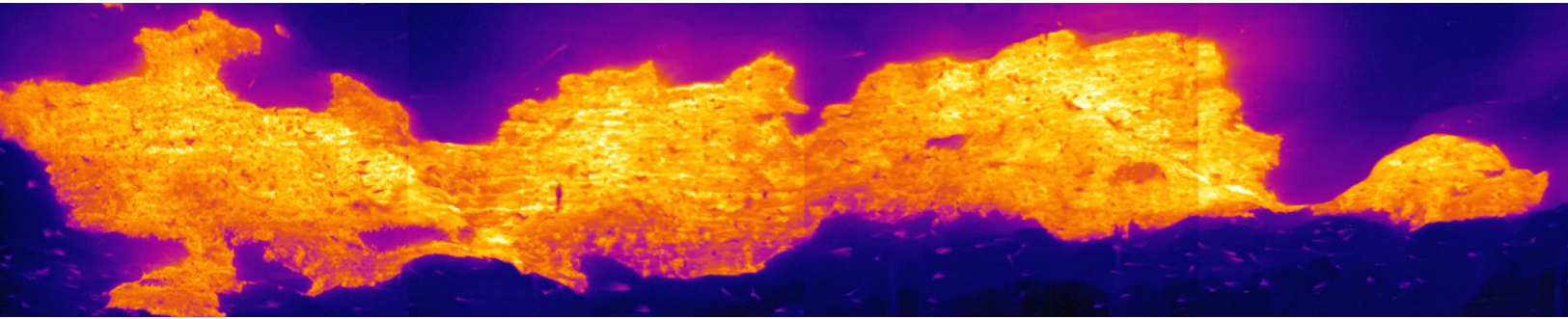
making a case, taking space

If you invite more than one scientist to present, be prepared! In a roomful of scientists, expect a bit of tension. Scientists may have major or minor disagreements. When they make their case to each other, the interaction can be electrifying. If you and visitors have a chance to listen in, you may get a new perspective on what you thought was settled science. Plan ahead for a facilitator or a timekeeper. Big egos will take space.

*Have a plan in mind for managing personalities and airtime.*



# Brought to you by iSWOOP



Interpreters and Scientists Working on Our Parks, also known as iSWOOP, has worked with rangers and scientists to raise the profile of park-based science.

iSWOOP's Origin Story began at Carlsbad Caverns in the mid-2000s. On summer evenings visitors waited for thousands of Brazilian free-tailed bats to emerge from the cave. Scientists were using thermal cameras to more accurately count the bats. Visitors approached with questions. But they soon backed off—unless a ranger jumped in to facilitate the conversation. Together park rangers and scientists were a powerful team.

iSWOOP fostered new collaborations to showcase park-based science open conversations with the public on how scientists know what they know, what it takes to figure it out and why findings are relevant. Visitors were grateful and curious.

Even stories of incomplete studies can inspire scientific thinking and get the next generation on board with investigating all the unanswered questions that abound.

iSWOOP leaders can't thank park staff and scientists enough for your creativity, generous gifts of time and commitment to communicating with public audiences. We wish we could call each of you to say thank you!



Read more at  
[www.terc.edu/iswoop](http://www.terc.edu/iswoop)

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# THE END



Or The Beginning of the  
Actual Work

