Colleen Iversen:

That is also something that I think a lot about as an editor is how to make sure that the reviewers that I've selected who are volunteering their time, and it's the same for the grant review panel. You're volunteering your time, but it's part of the job we're expected to do, how to make sure that feedback is helpful and constructive. The way that we like to talk about it is curious and courteous, I think, is the way that we like to think about the feedback.

Speaker 2:

This is the ORISE Featurecast. Join host Michael Holtz for conversations with ORISE experts on STEM workforce development, scientific and technical reviews, and the evaluation of radiation exposure and environmental contamination. You'll also hear from ORISE research program participants and their mentors as they talk about their experiences in how they are helping shape the future of science. Welcome to the ORISE Featurecast.

Michael Holtz:

Welcome to the ORISE Featurecast. As ever, it is me, your host, Michael Holtz in the Communications and Marketing Department at the Oak Ridge Institute for Science and Education. We have a really interesting topic to talk about today. ORISE has launched a peer review resource hub, which is exactly what it describes itself as. It is a resource hub for folks who do peer review. I have the pleasure today to talk to a peer reviewer and we'll get into what all of that means.

My conversation today is with Colleen Iversen, who is a principal investigator at Oak Ridge National Lab. She has been a peer reviewer for the Department of Energy, and we have a lot to get through today. So, without further ado, Colleen Iversen, welcome to the ORISE Featurecast. I'm so glad you're here.

Colleen Iversen:

Thanks. I'm looking forward to the conversation.

Michael Holtz:

I am too. I've been an advocate peer reviewer, so representing the patient voice. So, I understand a bit, at least from that perspective about peer review. So, I'm really looking forward to digging in on the scientist perspective of peer review, but let's start with telling me a little bit about who you are. What's your professional journey? What do you do? How did you come to be a reviewer, all of those things?

Colleen Iversen:

Yeah, so I am what I refer to myself as an ecosystem ecologist, and so I'm interested in understanding interactions between the living and non-living parts of our world. I actually did my dissertation research at Oak Ridge National Laboratory through ORISE, and then I was an ORISE postdoc in 2008.

Michael Holtz:

Nice.

Colleen Iversen:

Then hired as a staff scientist at Oak Ridge National Lab in 2010. Since then, I've worked on several different projects investigating the natural world in forests, in bogs, in Arctic tundra. I currently lead a large project that spans three national laboratories in the University of Alaska Fairbanks where we're looking at the rapid changes that are happening across Alaska and the pan-Arctic and putting that information into the virtual world of models.

Michael Holtz:

Oh, my God.

Colleen Iversen:

So because that work is funded by the Department of Energy, I have the opportunity to interact with program managers there and with the broader community of folks who are funded by the Department of Energy.

Michael Holtz:

That sounds like amazing work. Colleen, we may have to come back and have another conversation just about that research at some point. That sounds amazing.

Colleen Iversen:

Yeah.

Michael Holtz:

So you are a principal investigator. So, you have your work peer reviewed and you've served as a reviewer. Talk about what peer review is and why it's important.

Colleen Iversen:

Yeah. Part of what we do as scientists is not just the scientific method of looking at the world and asking questions and developing educated guesses or hypotheses about why the world works the way it does and investigating it. But science isn't science until you tell folks what you've found. The way that we do that as scientists is we go to conferences and we give talks. We talk to folks like you. We talk to the public, and then we write proposals to our peers for funding to continue doing that science. We also write papers that are reviewed by our peers as well. So, in that context, I'm actually an editor for a journal where I facilitate peer review of journal articles. So, there's two different aspects of peer review. One is-

Michael Holtz:

Absolutely.

Colleen Iversen:

... the review of papers once the science is done and one is at the beginning of the process, the review of the proposal to do that work.

Michael Holtz:

Right, both of which are very important processes in terms of folks on the back end understanding what the science says is agreed to you and valid and all of those things. Then on the front end with the grant proposals is making sure that the science proposed is going to work and achieve the aims with the proposals.

Colleen Iversen:

But it's a good idea. I think part of one aspect to me of being a peer on grant proposals is sometimes the best proposals are proposals that are foundationally set in excellent science but risky. So, you don't know if they're going to work, and that's what makes them exciting. That's part of the scientific method. Failure has to be an option to move the field forward.

Michael Holtz:

Absolutely. Do you recall the first time you were asked to review grant proposals and what stands out to you about that experience?

Colleen Iversen:

Yeah, so I can describe a little bit of what that looks like for the Department of Energy's peer review process for grant proposals. So, I was asked very early on in my career as a staff scientist. So, I'd just been staff at Oak Ridge National Laboratory for a couple of years, and my program manager reached out and said, "Would you like to be on a peer review panel for this open funding call where we're getting in proposals that we would like to review and see which ones we would like to fund?" So what that looked like was I was sent 12 or so proposals. Proposals can be 100 pages. They include science, but they also include budgets. They include resumes or curricula vitae for the staff who are proposing to do the work.

They include logistics and project management and all those sorts of things. All of those things are things that you're being asked to review. So, you read 12 100-page proposals and you're given a rubric. So, you're given things to look at. You're being asked to look at the science, but you're also being asked to look at whether or not the budget's feasible or if the data archival plan is reasonable, if they have a fieldwork safety plan. All you're being asked to do is really what falls within your expertise.

You're not being asked to know about the physics of what's being proposed if you're not a physicist per se, and that's why you're not the only one reviewing why you have 11 peers. Then we gather together in person in Washington, DC with our program managers and my program managers happened to be in the environmental system science program within the biological and environmental research program within the Office of Science of the Department of Energy. So, there's lots of specific kinds of science being done within the Department Of Energy.

Michael Holtz:

Absolutely.

Colleen Iversen:

And over the course of two days, we talked through what we thought of each of the proposals. I think that in itself is a valuable exercise as well because you get to see what other folks think and how they think.

Michael Holtz:

Yeah, as I mentioned, I've been an advocate reviewer and I do love that part of the conversation among the panelists to understand what is being proposed, but then also they're asking each other questions or putting in their opinions about, "Well, it could be this and are you using the right..." I know this is not necessarily a case for this, but are you using the right genetically altered mouse model and whatever the science is? Are you doing using the right tools to get the work done? Was there anything that you were surprised to learn about the process when you first got involved?

Colleen Iversen:

I guess I wouldn't say surprised, but it was all new to me. So, I hadn't really considered. Before I was staff, I was the recipient of funding from the lead investigator on projects that I worked on. So, I hadn't really considered how that funding had made its way to the lead investigators. So, getting to see the way that my program manager describes it as how the sausage is made behind the curtain and getting to see all of the moving parts, how seriously people take it. It's so important. This is the point of the realm, is putting your ideas out there and receiving funding to be able to see how those ideas work in the real world. So, folks take it very seriously. It's a serious business. You get to see whether other folks are hard graders compared to you.

Often you'll be asked for a numerical score, which it's there, but you're also writing a lot of what you're thinking. So, it's not just the numerical score on the end, but you see that some folks are unwilling to give high scores no matter how great. So, the project that I lead, we have 80 folks right across four institutions. So, a lot of what we do is have conversations on team science and the yes and of a conversation and how to have a constructive conversation where you might disagree but continue to discuss. So, I think being on a panel with 11 other folks, we have different ideas from you is the first instance where you get to in person have a conversation with other reviewers and figure out where our points of agreement and disagreement and how to keep that conversation constructive.

Michael Holtz:

Right, and it's important to note that the proposers get the feedback from the panel. So, you also don't want to be ugly necessarily in your comments.

Colleen Iversen:

It needs to be constructive feedback.

Michael Holtz:

It's really all about constructive feedback.

Colleen Iversen:

Exactly. That's true for at the end of the process, like we said, grant proposals are the beginning and then the end is the paper that you submit to journals. That is also something that I think a lot about as an editor is how to make sure that the reviewers that I've selected who are volunteering their time and it's the same for the grant review panel. You're volunteering your time, but it's part of the job we're expected to do, how to make sure that feedback is helpful and constructive. The way that we like to talk about it is curious and courteous, I think, is the way that we like to think about the feedback.

Michael Holtz:

I like that a lot. Was there anything that you felt unprepared for being a new reviewer? I mean, I know you mentioned page length. Those proposals are honking.

Colleen Iversen:

They're so long. I think that each of us, no matter how far we've progressed in our career, carry with us a little bit of imposter syndrome. So, I felt uncomfortable at the start sharing my opinion as a baby scientist to a group of 11 other scientists who might be senior or emeritus or very distinguished names that I recognize and had looked up to for so long, but I think a really good panel and group of program managers facilitates the panel in a way that results in you just being able to share what you think in a very safe and supportive atmosphere and in a way where you can really learn a lot about the opinions of others.

A good program manager is one that will actually ensure that they have early career folks on their panels because early career folks tend to have the best and most exciting ideas, I think.

Michael Holtz:

Right. Well, and that makes perfect sense because they're newer to the science. They're new to research. They're maybe newer in their field, so they're thinking about things differently than folks-

Colleen Iversen:

It is.

Michael Holtz:

... who've currently been around for a while. You've talked a little bit about what being on a review panel is. Have there been times that you have disagreed with another reviewer's evaluation, and how does that work? I know we've talked about being courteous and curious, but when you have a serious disagreement, how does that play out?

Colleen Iversen:

Yeah, there's a couple of different ways. I think the best possible scenario for disagreement is actually a really interesting exchange because like I say, we are all only being asked to judge the proposal based on our own expertise. A lot of scientists have very deep expertise, but not very broad, right?

Michael Holtz:

Got you.

Colleen Iversen:

You know a lot about what you know, and so it's really useful to be like, "Okay, I read this and based on what I know, it's really a great way to measure this thing." Then someone else on the panel might say, "Yes, but I've worked in ecosystems that have this snow pattern and this won't work in that particular ecosystem." That's valuable for me because it might be an ecosystem I haven't worked in before. So, I learned something in that way.

The areas of disagreement where I don't like are where someone else will not like a proposal based on vibes. So, they'll have a good reason for not liking it thing. I don't like that. I really think that having the program managers facilitate a panel in a way that keeps things based on that proposal and not based on a relationship that that person has had with whoever's proposing in the past or past work-

Michael Holtz:

The feeling that you have about a proposal.

Colleen Iversen:

... and what we're doing at hand I think is really, really helpful.

Michael Holtz:

Got you. That makes perfect sense. You mentioned there's a time commitment. I mean, if you're reading 12 100- or however many page proposals, it takes time to do that. How do you assess whether you have the time to truly give a good and thorough review?

Colleen Iversen:

Yeah, I think that's a great question in general, and something that I talk a lot about with my team is time management because we're pulled in so many different directions. What I would say is that as you're coming up as a young scientist, most of your time is spent doing science, but as you develop your scientific career, there are many aspects that go into the responsibilities of being an excellent scientist. That is not just doing science, but making sure that we are providing service to the community by way of reviewing grant proposals or papers, by mentoring scientists that are coming up behind us, by training and all of those sorts of things.

So, I would say the first point is that this is part of our job. It's not an extra that you do just out of the goodness of your heart, but it's an expectation. We have lots of expectations. Then the next point would be it's important to fit it in at some point, but you don't need to do it every year. You don't need to review a paper every month. I would say try to fit it in when you can, and that will depend on where you're at and what you're doing at that given moment, which isn't a good answer, but I would say if you have your glass jar and you're trying to fit in the sand and the big rocks and the medium rocks, there should be at least part of the sand or the medium rock. But how to fit that in is very specific to individual scientists.

Michael Holtz:

Well, I imagine too that it's beneficial to your science to be a reviewer, to see what everyone's talking about, what everyone's, I guess, other work that's being proposed that maybe isn't in your lane.

Colleen Iversen:

Yeah, that's such a good point. I would say also, it's not just something that you do out of the goodness of your heart. It really does teach you a lot about not just the new science happening out there. I would say I learned more about how to write a good proposal or what a not so great written proposal looks like, right? If you're reading 1,200 pages, you don't want it to be 10 point fonts and no pictures and figures. So, just thinking about what the reviewers are doing and then how grantsmanship, which is what we call selling of your science in a way that you don't get to come in person and talk to the folks, you have to convey the interest and the novelty and the excitement through your words to folks who will have read 11 other proposals at least.

So, how to do that well is something that you do learn after reading several of them and then how that's received by your peers. What works for me might not work for other folks, or they might've looked for something that I hadn't looked for. All of that is such a wonderful learning experience. In fact, the review panels I was on, I was on more earlier in my career, and I think that was quite helpful as an early career scientist thinking about what that looks like.

Michael Holtz:

That's really, I think, an important point is get in there early and learn everything you can about the proposal process or the grant writing process and how it can help you. You've talked about this a little bit, but obviously, you've found that your proposal writing benefits from being involved in the peer review process because of what you've learned.

Colleen Iversen:

Yeah, and it's the same. Reviewing papers for journals, you learn a lot about what a well-written story, scientific story looks like, and you also get to see what the other reviewers thought. That's true for grant panels as well. So, you might think, "Well, these are the critiques that I had and this is what I thought was great," but you get to see how those line up with several other folks.

That helps to calibrate your expectations, I think, both for yourself and for other scientists in general. I think early in their career, a lot of scientists have very high expectations because they haven't had to get into and do yet. So, it's really useful to calibrate that more to what's feasible if you're traveling to Alaska in the winter to a place where you have to helicopter in. Just calibrating your expectations I think is useful as well.

Michael Holtz:

Yeah, yeah. Speaking of young and early career scientists, what advice do you give to... I'm an early career scientist, I'm about to do my first review. What advice do you give me for that process?

Colleen Iversen:

I think the first advice I would give is leave enough time to make sure you can really spend the time that's warranted by a team that might've spent months or a year putting together that proposal just to be a good colleague. Making sure you set aside enough time to give the critique that is warranted for each of the proposals, to think about having looked at the rubric before you start. Think about the things you're looking for. Okay, I know that my sponsor has put out this call and these are the three parts of the call that they really wanted. Does this proposal even meet that first part of the call? Is it answering the request that our sponsor is looking for? Does it have all the pieces, and then is the science good?

So I like to take notes as I go because I like to have the rubric electronically and take notes as I go and make sure I'm hitting all the pieces. Then at the end, I'll go back and write paragraphs. Then the nice thing about the review panels that I've been on is they let you edit at the end. So, you do turn in your reviews before you go to the panel to discuss, but they reopen them while you're there. So, you can be like, "Oh, that's a good point. I shouldn't have said this," or "Oh, I missed that. I'm going to add this now. I'm going to change my score." So it's really two parts. It's the reading and the written part, and then it's the discussion and revisiting part.

Michael Holtz:

That you can update/moderate your review depending on what you've heard in the conversation. So, you can go back and say like you said, "Oh, I missed this," or "This part is really important to me. So, I want to restress again, whatever that looks like."

Colleen Iversen:

Then the program managers will go through at the end and make sure that the reviews are curious and courteous before they make their way to the scientists. So, there's another level of making sure that we are being constructive, especially to folks that are probably earlier in their career as they're writing these proposals.

Michael Holtz:

Sure. That makes perfect sense. You talked about the time that it takes to write a proposal, an article, and I think it's perfectly fair to expect a reviewer to write, not wait until the last day of the review period, for example, to try to knock the reviews out that it took the proposal writer, it took the article writers, because it's often a team, time to put their proposal together, write their article. They deserve the fairness of quality time spent with their document, whatever it is.

Colleen Iversen:

I think fair is a really good way to put it. I will also say this is a benefit to you as well, because your program managers maybe didn't know you before they put you on the review panel. This is your opportunity to show them that you are thoughtful and constructive and a good member of the community in addition to having great scientific expertise and ideas. The same is true for your peers. So, like I say, you're rubbing elbows with folks that maybe established in your field and may not have known you.

This is your opportunity to show that you are a responsible, organized, and good future collaborator for some of the folks on the panel. I mean, you do end up going to dinner in the evening and you get to develop professional relationships in that way, including with your program managers. So, the opportunity to put your best foot forward starts with making sure that you've allocated the appropriate time and scientific input to what you're being asked to do.

Michael Holtz:

You want to be invited back.

Colleen Iversen:

Yeah. Well, sometimes.

Michael Holtz:

Ultimately. You don't want to be the guy that's like, "Maybe not this person."

Colleen Iversen:

Yeah, we don't really want that person anymore. I mean, it's all meant to be professional and unbiased, but people do develop relationships within the community of people that folks don't want to work with. You don't want to be one of those people because especially the Department of Energy and the National Laboratories, science is a team sport. So, you want to be seen as a good team member.

Michael Holtz:

Absolutely. Colleen, is there anything we haven't talked about that you want to make sure that we address before we wrap up our conversation?

Colleen Iversen:

There's one thing I wanted to mention that's a little specialized to the projects we have at the National Labs, but I thought that folks might be interested in.

Michael Holtz:

Sure.

Colleen Iversen:

So the project that I lead in the Arctic, because it is funded through the National Laboratory System, I'm at Oak Ridge National Laboratory, we are contractors to the Department of Energy. The way that our proposals are reviewed are in person. So, for example, we wrote a renewal proposal for our Arctic project last year, 80 folks on the team and then 20 folks from the leadership team traveled to Washington, DC. We were met with a panel of 12 international Arctic experts and 10 program managers. We spent two days in a room giving talks and defending what we had written in the written proposal. So, our defense of our proposal was in person, and this is the way it works for proposals written by national laboratories.

It's a double-sided point because on one hand, you can say, "Oh, that's not what we meant in the way that you're interpreting this writing." So you have the opportunity to correct a misinterpretation. But on the other hand, it's very much like having a dissertation defense over a period of days with a broader team. But you get to meet your peers and you get to learn how they read your words and how they were interpreted. That teaches you a lot about writing the next proposal because you get to hear in person how it was read and interpreted.

Michael Holtz:

Awesome. Then you go back and revise and take in the feedback.

Colleen Iversen:

Yes. Lots of comments that we address to go forward, and then the program managers make the final decision. They're there too, listening to how the team responds and how the reviewers are questioning. Again, this is one of the most important things that I tell my folks. This is like you get to meet reviewer number two in person. So, if you in your mind are like, "Oh, they just don't get it," and you want to answer in a snarky way, that's not going to happen in person. So, it teaches you a lot about how to have that constructive yes and conversation to make science better when you're doing it in person.

Michael Holtz:

I like that. I mean, it sounds like dissertation defense turbocharged.

Colleen Iversen:

It is.

Michael Holtz:

Beyond words.

Colleen Iversen:

It's a privilege though, for sure.

Michael Holtz:

Yeah, I mean, it sounds like an amazing experience, A, in part because of the feedback of it you get, but also the relationships you get to build and just the opportunity to get to a point of agreement with all of the people involved in the process.

Colleen Iversen:

So we invited one early career scientists from each of our national laboratory and university partners to come to the defense just to see how it works. I think that that's really helpful for them as well. You learn a lot about the review process that way.

Michael Holtz:

I love it. I love it. I have one more question.

Colleen Iversen:

Okay.

Michael Holtz:

Colleen, what brings you joy?

Colleen Iversen:

What brings me joy? That is something that I put on my calendar to think about every day.

Michael Holtz:

Do you really?

Colleen Iversen:

And so my family, first. I have two kids, but for me, the joy is the natural world and getting to figure out how it works. So, now that I'm the principal investigator, I don't do as much of my own science as I used to, but my own science started with investigating the hidden world beneath our feet, the tangling of plant roots with the surrounding soil, and the joy of getting to observe things as part of my job that nobody gets to see or think about brings me a lot of joy. Then people, getting to lead a team of 80 folks and setting expectations for how we treat one another, and that's the foundation that makes science great, the relationships that you develop to push the field forward. So, that brings me joy as well.

Michael Holtz:

Awesome. Well, I love that answer. I love that you think about it every day. Thank you again for your time today. I really do appreciate this and helping us get a better understanding of the peer review process. This has been a great conversation. Thank you so much.

Colleen Iversen:

Thanks for the opportunity. It was lovely to spend time.

Michael Holtz:

Awesome. Thank you again.

Speaker 2:

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