Ask a Biologist vol 025 Topic: NSDL
Guests: Kaye Howe, Carol Minton-Morris, Samantha Katz, Lee Zia

**NSDL -**

Have you ever wished for a place on the Web where you could find quality science content that you can count on and trust? Your wish has been granted. Learn about the National Science Digital Library and all the projects and resources created just for science, technology, engineering and math. It's as close to one-stop shopping for learning materials and activities as one can find on the Web today.

## Transcript

**Dr. Biology**: This is "Ask a Biologist," a program about the living world, and I'm Dr. Biology.

Have you ever gone on a computer, picked your favorite search engine - whether it's Google or something else, put in a topic and what you get back are over a hundred thousand or maybe even a million results? What are you supposed to do about that? And how do you know that any of them are any good?

Well, we're on the road again and we've come to Arlington, Virginia - just outside of Washington D.C. We're at the National Science Digital Library Conference. If you remember from an earlier program, we talked with Nancy Pelaez at the National Science Foundation. She let us in on the NSDL and some of the cool things that are going on. I thought, "Hey - we've got to learn more."

So today it's our chance to see what the NSDL is doing. We're going to talk with just a few of the folks that are involved with the NSDL. I say "just a few" because there are hundreds of people responsible for the web tools and websites that are out there.

And, well, if you're a science student, a science teacher, or maybe someone that just can't get enough of science and technology, this is the site for you. Even if you're not a scientist at heart, you'll want to listen in because they also have some great resources for doing homework, and maybe even getting help with your math.

While we're here - I'm sure you can hear it in the background - there are people talking. There's all sorts of action and excitement. Maybe you're not familiar with conferences or meetings that scientists go to; they're actually very common. We like to get together face to face and talk about our work.

You can think of it as a giant "show and tell". Some of us bring posters and present the work we've been doing, others give talks. We swap tips and tricks and figure out what are the latest things that are coming on the horizon?

As a whole, the meetings are, well, very fun and turn out to be rather creative. I've even heard a rumor that one of the folks involved with NSDL is a talented author of haikus,

which are a form of Japanese poetry. We'll see if we can get them to read one on the show.

Right now, let's take a walk and see what we can do about finding and talking to some of the people who are responsible for the National Science Digital Library.

I haven't had to wander very far to come upon Kaye Howe, who is actually rather important to the whole NSDL project. Kay, can you tell us just a little bit about your role with NSDL?

**Kaye Howe**: I am the Executive Director of NSDL - what's called the Core Integration part of NSDL. That's sort of the organizational part that runs it.

My own background is in comparative literature, so I'm not a scientist and not a mathematician. But I have a lot of experience. I was vice chancellor at one university, president of a small college, so that's the part of me that they hired on.

**Dr. Biology**: Being involved with literature, you're also interested in communication. We've talked about... If you do science and you don't communicate, there's no point in doing it.

**Kaye**: Well, in fact I think this is a huge problem for science - it's so core to everything - the nature of the physical and biological world. And yet somehow we've gotten into our minds that only very smart people can be involved, only very smart people can understand it. The rest of us apparently have no obligation, even though many of the great policy issues for our particular country, not to say the world, are things that are deeply involved in a knowledge and understanding of science and mathematics and technology and engineering.

So we need more and more and more clear communication about science - it's really critical to our welfare.

**Dr. Biology**: I have to agree. We've actually talked about that quite a bit.

One of the things that I mentioned at the beginning of the show is that we're actually at this conference, and we've got hundreds of people that are here. I'd like you to talk a little bit more about NSDL. Would you let me know how many people are really involved with this?

**Kaye**: It is very hard to say how many people are involved in NSDL. Over the past five years, there have been well over 200 NSDL grants. But each NSDL grant involves a lot of people and a lot of organizations.

So our so-called pathways, which are disciplinary or audience-focused portals, each of those is an aggregation of partners. NSDL is really about partnership. It's about leveraging, it's about content and technology and access to communities, it's about K-12, it's about undergraduate and graduate education. So we have a huge range of interests, and only through a series of partnerships all over the place are we able to handle that.

**Dr. Biology**: So NSDL is very large; there's a large group of people that are involved with it.

The people that they're trying to reach - we talk about teachers, we talk about the students. What about, say, the sixth grader out there? What are they going to want to go up and look at NSDL?

**Kaye**: I think we should really say, Dr. Biology, NSDL is a so-called digital library. It is about content, it's about access to content and it's about communication among all the people who are interested in that content.

So, say you're in sixth grade. You could use NSDL - we'd be happy about that - to look up things. You're doing homework, you're doing a science fair project, you're just interested in something.

But it's a way for you not only to supplement your work in school, as it is, for your teacher. It's a way for you to pursue an interest of your own. You're not trapped in sixth grade in Boulder, Colorado.

You know, suppose you are really really interested in DNA. Off you go in a digital library like NSDL to find out everything you want to find out about DNA. So it's a means of independent search for knowledge as well as being a compliment to formal education.

**Dr. Biology**: Truly, learning has no boundaries this way.

**Kaye**: Learning has absolutely no boundaries. We know that it really doesn't.

**Dr. Biology**: When you say a digital library... now, I imagine a library... books, and in the books I have pictures and maybe I have audio files... What can you find on NSDL as far as a library?

**Kaye**: The sky is the limit. And one of the things that makes that possible is digitized material. Most of us, we're very familiar with libraries, we all love them. But we think in terms of books, we think in terms of articles, maybe more recently we think in terms of images, we think in terms of documents. But there were certain formats that we were all very familiar with, and they tended to collect things in one way or another.

The digital library gives you the capacity not only to go to a book, not only to go to an article, not only to go to a data set but to go to an image, to go to a part of an image, to go to a particular data point, to go to a particular map. So what we call in digital libraries "granularity" - that is, the size of the object - that's almost infinite as far as we're concerned.

Whereas a "brick and mortar," as we say, library might have to say, "Look, I mean, we have 85 billion things..." Size is really no barrier for a digital library. So whereas in physical libraries there can be a scarcity of materials because of storage, because of cost, because of all kinds of practical issues, for digital libraries that really doesn't matter. And that means that there's no longer a scarcity of content.

We've got content, content, content. We're overwhelmed by it. We need access to that content. Those are the jobs of digital libraries.

**Dr. Biology**: Right. You mentioned content, content, content. And that's the other thing. You go on Google and other search engines, and you end up with results when you put in 'tectonic plates, ' for example, and you'd end up with, oh a million results. Is NSDL going to help me do things better?

**Kaye**: Yes, the specialized digital library provides a filter as to number of resources but most importantly to quality and the source of those resources on a huge database like Google. I mean, like Google is wonderful. I use it every day. I'm sure you use it every day. It's a way to go in and find a resource and in fact people may find their way to NSDL through Google. They may go look up tectonic plates, find an NSDL collection that's coming out of the geosciences disciplines, so you know the material is going to be good. I'm a teacher, I can trust these people. I know that this is from "National Geographic." I know this is from "Science" magazine. I know this is from the Library of Congress, whatever. And get down the choices because there is so much material the problem is how do we filter that and how do we find quality.

So Google is a great phenomenon but the specialized digital library helps us to find what we need and what we need especially in the context of quality in a more efficient way.

**Dr. Biology**: Well, we're here and we can hear lots of laughter and people going around us, as we are walking around through the conference room here. Do you like going to conferences and what do you think is the most exciting thing when you go to a conference?

**Kaye**: I tell you, sometimes you can get tired of conferences, but I like this one very much. I like a lot of them because even though the world is digital we have many means of communication and we use them all the time; they are hanging off all of us.

There is nothing, there is absolutely nothing that takes the place of face-to-face meetings of people who like this group of NSDLers who are passionately devoted to something. They are full of ideas and where the real creativity comes is in the intersection of all of their activity. Sitting down with people, talking to people, the casual conversation, the walk down the hall with somebody, looking at their poster (as you know a great vehicle in science conferences) looking at that and thinking, I could do something with that. You know, that's going to work for me.

**Dr. Biology**: If you look around here people are just really energized by each other.

**Kaye**: Energy is exactly the word. I think that's...You know, they talk about politicians and how they get energized by going out and seeing crowds. I think that happens for all of us. To see your colleagues...intellectual work, as you know, any kind of work you can feel isolated. You're just...there you are, doing your work. It's just you. You're worrying, whatever. And then you see all your colleagues and you have that collective energy and you support each other. That is a wonderful phenomenon. Education in particular is so

much a function, not only of the individual but the individual in a very important community, and that combination of the bright engaged individual and the supportive community and the human energy that comes out of that and the intellectual energy, really, nothing is better than that.

**Dr. Biology**: OK, Kaye, it's been wonderful being able to get a chance to talk to you. NSDL is marvelous and we will look forward to all the great things that are going to be coming out of this collaborative effort.

**Kaye**: Thank you very much.

**Dr. Biology**: That was a great overview from Kay Howe about NSDL. I'm anxious to learn a little bit more and actually I see the next person I want to talk to right up ahead.

This is Carol Minton Morris that I have caught up with. She's the communications director for the National Science Digital Library. Since Ask a Biologist, that's what we're all about, and we're trying to improve communication about biology, especially with this podcast, I'm anxious to hear what she has to say about NSDL. Also I've heard that you have a background in the fine arts, which is the same thing I have; my undergraduate degree was in fine arts. Is that true?

**Carol Minton Morris**: Yes, I have a degree in fine arts from the University of Wisconsin, Madison. I have used my degree primarily in the publishing industry. It didn't seem like it at first, but it was a natural path for me to move into information science because working with visual images and designs is really just another kind of information that we manage.

**Dr. Biology**: Yes, absolutely. Talking about communicating, with NSDL, what I want to know is how do you get to it?

**Carol**: http://NSDL.org.

**Dr. Biology**: Well, you're the communications director so I figured we got to get that in there or you'd be in trouble. What are some of the best things about NSDL?

**Carol**: For me the best things about NSDL are really a combination of how we have built social networks and technology networks to better serve our users who are primarily teachers and also undergraduate instructors and professors.

**Dr. Biology**: So is there room for kids like the ones that are K through 12? Or middle school or sixth grader. Am I going to go on NSDL and find some cool things?

**Carol**: Yes you are. You could go into the E-skeletons website, Eskeletons.org. Check it out; there's some three dimensional bone viewers in there that you can manipulate in space. It's just really fun.

**Dr. Biology**: How cool is that?

**Carol**: It is really cool. You could also visit the NSDL middle school portal, which has a lot of really good information for students who need help with their homework in those grades.

**Dr. Biology**: A homework helper, yes. I know a lot of the students that will come to the Ask a Biologist site, they want homework help and even though we'll answer questions, we always say we don't do homework. So, if they have a place to go, they're going to be at NSDL.

**Carol**: There's another site, the McCauley Library of sound and video. It's the largest sound and video collection online on the planet. If you like animal sounds from elephants to whales to dolphins to birds, you can find those things there.

**Dr. Biology**: That's marvelous. Now on Ask a Biologist we do have a virtual aviary of birds but we certainly don't have any whales yet. I'm going to have to check that out. Well, what are some of the other things you would recommend for people to try out on NSDL?

**Carol**: They might want to visit the NSDL blogosphere, which is found at http://expertvoices.nsdl.org. There are many wonderful blogs that are being created by people who are combining learning resources with additional information about those resources, including alignment to learning standards.

**Dr. Biology**: So now we're talking to our teachers. You were talking about a social community or social network. For kids, they probably think about MySpace or Facebook. For teachers is this kind of the place to go or certainly a place that I would go if I want help when I'm doing my lesson plans.

**Carol**: Yes, it is a place where you go to get help with things like lesson plans. We have a workshop series, an online workshop series that we are running in collaboration with the National Science Teachers Association. Every month there is a web seminar that takes a different topic and really spins it out for teachers. So that they can get more ideas for how to use resources form the National Science Digital Library in their classrooms.

**Dr. Biology**: Excellent. Well, we're at the conference here and we have these wonderful posters, they're all around and have been talking about why we go to scientific meetings. Have you enjoyed going to meetings yourself?

**Carol**: Yes. I have.

**Dr. Biology**: What's the best thing about a meeting for you?

**Carol**: I tend to get very inspired by wonderful speakers who are communicating big ideas. An example of a wonderful meeting that a lot of scientists go to is the American Association for the Advancement of Science and there are often plenary speakers. Those are the speakers with the really big ideas to share who are Nobel Prize winners. So it's an opportunity to spend time with someone who you ordinarily wouldn't get to spend time with, and you can even ask them questions.

**Dr. Biology**: Marvelous. I have a suggestion, and I'm going to put you on the spot. NSDL is a great group, I have to say. This is the first year I've been here, I'm so excited. I'm really interested in getting networked with a lot of the people. But one of the things that was missing that I'd like to see more of--there were a few teachers here--but I'd like to put a call out for more teachers to come to the meeting.

**Carol**: I think it's a good idea. I think that perhaps as this meeting evolves, it will become a place where educators can share more of their expertise at different levels, and they really make the connection between the information and the resources and the students. The teachers are the connectors.

**Dr. Biology**: Now, I want to do something with you, I do this on every program. I'm going to take away your art and your communication. You're going to have to pick another career or another thing you would do with your life.

**Carol**: I'm glad you asked that because I'm also a yoga teacher. So if I wasn't working for the National Science Digital Library, I would probably be teaching some more yoga.

**Dr. Biology**: Now, we're talking about something that has physical activity, but it's also almost a spiritual thing, right?

**Carol**: Well, for a lot of people it's a spiritual thing. Yoga can be practiced on a lot of different levels, and people certainly use it as a physical activity as a way to stay in shape, but also people use it as a way to staying more centered inside of themselves.

**Dr. Biology**: Well, Carol Minton-Morris, the Communications Director for the National Science Digital Library, I really appreciate you being here and joining us with all the people. You can hear the rumbling in the background, that just means everybody's having a great time.

**Carol**: Thank you very much. I appreciate it.

**Dr. Biology**: As I continue walking up and down the aisles of the Conference, I'm getting a chance to look at more and more of the posters. Many of them are very colorful and all of them are very informative. It's become rather clear that this is a really big program. In fact, I have to say that, well, they cover just about all the sciences. But being a biologist, you can imagine that my goal is to find the people that are involved with the section on Biology, and they actually call their sections Pathways.

With a little bit of networking, I was able to find out that indeed, there are at least a half dozen people that are part of that Pathway here and with a little bit of searching, I've been able to sit down with one of them. Samantha Katz is the Director of Education and Outreach at the American Institute of Biological Sciences and part of the Pathway they call "BEN". By the way, what does BEN stand for?

**Samantha Katz**: BEN stands for Bioscience Education Network. It's a collaborative network of different organizations that deal with a range of biology programs. So, each society organization covers a different area of biology.

**Dr. Biology**: So, with a program like Ask a Biologist and I go to the NSDL Conference, I have to talk to people like you. We actually had I think five of you that were standing around and you won, you got to be on the program.

**Samantha**: Woo-hooo [laughter]

**Dr. Biology**: What I'd like to know is within NSDL and from a student's standpoint, where am I going to go to get help with my Biology? What am I going to type?

**Samantha**: You can type BiosciEdNet.org.

**Dr. Biology**: BEN, OK. Well tell me, what's one of the really cool things that you like with BEN?

**Samantha**: Well, beyond the fact that I can network with a lot of different biologists and a lot of different people, I'm able to provide resources to people that we create through our organization or that scientists create and we provide access to people.

**Dr. Biology**: OK, I can see this as really good for, maybe, teachers. So I'm in seventh grade and I'm doing a project, am I going to go to BEN? What am I going to do?

**Samantha**: Well, you're going to go to BEN and you're going to type either your subject or the content that you're looking for, and it will give you a series of resources whether they'd be articles, whether they'd be teaching resources. You can look through those and get information that you need.

**Dr. Biology**: Now, we talked a little bit earlier about how you could go to Google and do the same thing. But with Google, I might get a million things that come back. I'm taking it that BEN helps figure out what would be best and the easiest thing for me to work with?

**Samantha**: It does on a couple of different levels. One is that it provides you access to peer-reviewed research or articles.

**Dr. Biology**: Peer-reviewed, now wait a minute. What's peer-reviewed?

**Samantha**: So, as a community of scientists, when you generate a paper based on your research, you send it out to your peers. They review that paper and then that paper is sent to a publication, which can also peer-review that paper and tell you whether or not they think this science, or the methods that you used to study the project are good and valid.

**Dr. Biology**: It's kind of a quality control.

**Samantha**: Yes, it's like the stars that you get when you go into Amazon.

**Dr. Biology**: Excellent! Excellent! Now, one of things I'd like know about is, since we're at a conference here, why do you go to conferences?

**Samantha**: To network, to meet people. The Internet is wonderful, you can meet a lot of people virtually, but there's nothing like connecting with somebody on a face-to-face level.

**Dr. Biology**: Not only that, you often get to travel which is kind of neat.

**Samantha**: Yes, you do get to travel. I've traveled a lot but I live in DC so this one is a non-traveling.

**Dr. Biology**: What would be something that you'd like a teacher who's listening to this program to try out to get their feet wet in BEN, so to speak.

**Samantha**: Through the American Institute of Biological Sciences, we provide access to our website called ActionBioscience.org. It is an issues-based website that takes content and does it along seven biological issues that affect you--bioliteracy, climate change, so different topic areas. We have two things that we offer through that. One, our peer-reviewed lesson plans. So other teachers have used these lesson plans and said, "They're good." We also have peer-reviewed articles that take the science and chunk it down to a little less data-intense, a little more issues-based, and a little more people-focused. So I would suggest that that's an easy enter into how to search for it. You can probably type in action bioscience and get that content.

**Dr. Biology**: Very good. One of things I ask every scientist that I have on my program, I usually do three questions but we already have several people that we're going to be talking today. So I want to know--I take away your science. And obviously, you're interested in education, so I'm going to take those away. What would you be or what would you like to do?

**Samantha**: That's a good question. Well, right now, I'm a little busy. I am 26 weeks pregnant so I would be a mom, which is not that different from being a scientist or a teacher.

**Dr. Biology**: You'd be a mom, I could see that. Well, I can definitely see that.

**Samantha**: Yes.

**Dr. Biology**: I really appreciate you sitting down with us. I hope we'll be able to catch up with you in a future meeting.

**Samantha**: That would be nice.

**Dr. Biology**: There are so many talented and creative people at this meeting. I wish I had the chance to sit down and talk with each one of them but I don't. However, there is one person that I need to talk with before we go and that's Lee Zia from the National Science Foundation.

Lee is the lead Program Officer at NSF, in charge of the funding for the NSDL programs so you could call him the "money man". Lee is also a trained mathematician and a very talented author of haikus that I'm hoping he'll read at least one of them for us today. But

before we get started on that, I'd like to talk a little bit more about NSDL. In particular, when did we start NSDL and who came up with the idea?

**Lee Zia**: Our roots go back to around 1994. One of the Directors that's in NSF--these are the organizational units that fund our researches called the Computational and Information Science and Engineering Directorate--one of their divisions, Information and Intelligence Systems had started in 1994 a digital library research initiative. Several projects were funded that first year and about the same time, I came to NSF as a Program Officer and got interested in the potential for digital libraries because we knew this new program was coming out. So I was really a part of a small group within the Division of Undergraduate Education that were just brainstorming and thinking, "This is the direction we ought to go in." From that, we begin to run several workshops and eventually a program came into being. That's a typical kind of pace for a program.

**Dr. Biology**: So I'm going to describe you as the "money man" or the "money middleman"?

**Lee**: Sort of like that. NSF is a funding agency. We don't do any in-house research unlike, say, NIH, the National Institute of Health. But we conceptualize programs and we solicit proposals and then we're responsible for reviewing those, then making funding recommendations.

**Dr. Biology**: I've been walking around and you've been walking around looking at the posters and talking to people. It's really exciting here. What are some of the really cool things that you've seen developed and are on NSDL?

**Lee**: That's a great question. There is really so much. I think that there's some tremendous potential. As a representative of National Science Foundation, we're particularly interested in science education where we want to be able to reach learners of all ages in all settings, so both formal and informal. So I think some of the most exciting things available through NSDL are coming out of the informal arena.

We have a new project that involves a collaboration of several major science museums, Exploratorium, Lawrence Hall of Science, the New York Hall of Science, and they are really trying to organize the informal science education resources and make them available to a much broader audience. So I think that those are tremendously interesting.

**Dr. Biology**: Now, is this something they can get to on the Internet right now if they can, do you know the address?

**Lee**: Absolutely. If you go to NSDL.org, that's the entryway, but the digital library is very much a distributed enterprise just like the Web. In fact the philosophy behind the program is to engage in distributed library building. So that means that if you go to NSDL.org, you can go to some basic things, search and so forth. We certainly would encourage visitors to register, registration is free. You don't have to register in order to use the services, but like a lot of things, if you're willing to reveal a little about yourself, maybe your age, your grade band, your interests, then the searching can be more customized. But in the beginning, it's good to just sort of mess around.

**Dr. Biology**: Well, Lee, one thing that you have, you have a special talent that we've learned about over the years. I haven't known you that long but I can tell that this has been going on for a while. You're good at writing haikus. So I was hoping you would bring and you have a haiku with you. I'd like you to go ahead and--first, tell people what a haiku is because not everybody knows. I do find it amusing because there is a mathematical part to it so I'm not surprised that a mathematician is doing poetry that is responding to some kind of a mathematical formula.

So here you go, let's hear the haiku.

**Lee**: Sure. Yes, first you asked me to say what a haiku is. Haiku is a form of poetry, it's a Japanese word. I don't know exactly what it translates into, but the typical form--at least as I learned it when I was youngster--was a three-line poem with the first line having five syllables, the second line having seven syllables, and then the third line having five syllables again. So the format of the poem requires the author to be very concise and to try to distill the essence of an idea in there.

Well, I got started with this on a whim when NSDL launched several years ago. In one of our annual meetings, I was asked to make some remarks at that official launch. I decided rather than try to do a fancy speech or something like that, I thought, "Why not try to be a little creative and why not write some haiku." Well, one thing led to another and the next year people were saying, "Oh, so where's the haiku?" So I've been doing this for several years now.

Yes, I've written some for this meeting and I was just looking at the list here and I think I'll choose this one. Then, I'll sort of talk about that. So here we go.

"Learn what learners need.
Then meet that need in their way.
Start at the finish."

What am I thinking there? NSDL is very much about the learners. The designer of the program from the beginning said, "We need to design a learner-centric facility", a virtual organization if you will. What a digital library is a little hard to pin down and it would be too easy to get lost in technical discussions about what it is, what it can do and so forth. I believe, and this haiku tries to capture that, is that in this day and age, you need to really think about put the learners first. Think about what they want, and those needs are different, it depends on... Are you an informal learner, in formal science? Are you in formal settings in school? Are you an elementary student? Are you a graduate student? Are you an engineer seeking professional certification or continuing education?

All of those learners are in the spectrum of what NSDL is about. One of the things that technology does enable you to do is to provide customization, is to be able to say out of the vast resources that are out there and available on the Internet. Without an NSDL, it's just a wild woolly Web.

**Dr. Biology**: Right, and we've talked about that. You can do a Google search and come back with a million hits and that doesn't do you much good if you need to find the information.

Well, Lee, I really want to thank you for joining us here. We've had a chance to meet with several other NSDL people. I'm hoping that we'll do some more podcasts and maybe next year, we'll be able to catch up with you.

**Lee**: That will be great. I'd look forward to that.

**Dr. Biology**: You'd been listening to Ask a Biologist and my guests have been some of the people involved with the National Science Digital Library. Hope you enjoyed the program. I know I've learned a lot about NSDL and plan to visit and use many of the resources talked about today.

The Ask a Biologist podcast is produced on the campus of Arizona State University. For this show, we traveled to Arlington, Virginia to the annual meeting of the NSDL. Even though our program is not broadcast live, you can still send us your questions about Biology using our companion website. The address is AskABiologist.ASU.edu or you can just Google the words "ask a biologist".

I'm Dr. Biology.