

GLANSIS User Experience Research Report: Interviews

Jades Research Team

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Executive Summary

The following report outlines the method and criteria for the interviews of GLANSIS, as well as our findings and recommendations. Five participants were interviewed, one of which was the primary stakeholder and others were user interviews. We analyzed each interview based on. We asked the primary stakeholder to introduce us to some regular users or potential users who use GLANSIS for educational purposes. To recruit the participants, we contacted educators who might be potential users of the database. Each interview lasted approximately 30 minutes and were conducted remotely through Zoom.

From our Interview Report, GLANSIS is used a lot for undergraduate research and education from undergraduate educators. In addition, GLANSIS has many opportunities for building their educational hub. However, its current website falls short in some areas regarding the features from the educators' perspective. We analyzed the interview result by creating an affinity wall. Data from interviewees were categorized so we can have a better understanding of the overall opinions about GLANSIS in different ways. Through our interview study, we were able to conclude some key findings. These are:

The advanced search feature is comprehensive and useful especially to those experienced users.

The risk assessment feature gives ample information on a species.

The interactive and dynamic maps are one of the most helpful features.

There are many opportunities for building an educational hub in GLANSIS.

We could urge GLANSIS to consider four things as recommendations for building an effective educational hub for their system:

1. Including a quick search bar on the home page and all other pages
2. Providing an incentive to contribute reports and data to GLANSIS
3. Crowd-sourced reporting system of invasive species
4. Built-in tools and pre-generated exercises

Introduction

This report is produced by Jades Research, a group of graduate students, working with the Great Lakes Aquatic Nonindigenous Species Information System, GLANSIS. GLANSIS started in 2001 is a government funded project. It acts as a database with the aim of improving access to information on aquatic nonindigenous species for the Great Lakes. What started just as a database has now developed newer tools after conducting a series of interviews with educators and other users of the database. The website has tools such as profiles, map explorer, risk clearinghouse and references.

The team at GLANSIS now wants to move beyond the higher level analysis and focus on targeted user bases and particular features. For this reason our team is conducting a study focused on educators that use GLANSIS for literary purposes.

Primary User Groups

- Researchers
- Local/State Managers
- **Educators**

Research Goals and Questions

After the initial meeting with our stakeholder from GLANSIS, we understood that there were several user bases for the website. To gain a better and detailed understanding we decided to focus on one user base that is the educators who access GLANSIS. In order to do this, the key questions that we focused on were:

1. How undergraduate biology educators use GLANSIS for their classes?
2. What are the most helpful/useful features for educators?
3. What features could be improved or added on the current GLANSIS system from an educator's perspective?

It was important to delve into the user needs and habits of such databases in order to understand what is needed for the target population. The purpose of this report is to conduct these interviews and analyze the data gathered. Detailed below is the method used for this study as well as our findings and preliminary recommendations based on our analysis.

Project Goal

- Serving as a one-stop-shop serving all citizens of the Great Lakes region who need information on aquatic nonindigenous species.
- Building an 'educator hub' for undergraduate education.

Methods

To investigate our research questions we conducted 5 interviews in total. The first interview was with the primary stakeholder for GLANSIS and the other four were conducted with potential users, who are also educators. We compiled a set of questions to ask these interviewers based on their usage of the database. Once the interviews were conducted, we transcribed them and through creating an affinity wall, we developed three personas and scenarios. From here, we analyzed this data to come towards our findings and recommendations.

Stakeholder Interview

The first interview we conducted was with our primary stakeholder. The main objective of this interview was to familiarize ourselves better with GLANSIS as well as get a better understanding of the scope of the project. After the first interview, we realized that there were different target audiences that we could focus on. We decided on working with educators who use GLANSIS since they are frequent users of the system and are also contributors to the database as well. This would allow us to get in-depth information on the contribution process as well.

Recruiting Method and Target Population

Since GLANSIS has multiple user bases that could be focused on, we conducted an additional interview with the primary stakeholder to determine which user base to target. After narrowing down our target population, we let our stakeholders know of our scope. Once that was decided, we asked the primary stakeholder to introduce us to some regular users or potential users who use GLANSIS for educational purposes. To recruit the participants, we contacted educators who might be potential users of the database. Most of these contacts were referred to us by the GLANSIS stakeholder. We also used the information available to us through the University of Michigan and emailed the department of Ecology and Evolutionary Biology to ask if they would be interested in an interview. No compensation was offered to the participants.

User Interviews

- **Interviewer 1**

Interviewer 1 is the Program Director for The Ohio State University's Extension Aquatic Ecosystems program. He currently teaches upper level undergraduate courses in Freshwater Fisheries Management (or at least has done so in the last couple years). He was the Assistant Director for Ohio Sea Grant, during the period when GLANSIS first started.

- **Interviewer 2**

Interviewer 2 is the Director of Environmental Sciences at Wayne State University. She teaches Ecology and the Environment and Sustainability of

Urban Ecosystems and has recently taught a mix of other courses. Dr. Kashian worked at GLERL (~2011) and she worked with GLANSIS when they developed and tested the original risk assessment feature. She has also utilized GLANSIS's data on Great Lakes native species to create educational tools for students.

- **Interviewer 3**

Interviewer 3 is a professor that teaches biology and ecology labs at the University of Michigan. Her research focuses on molecular and cellular biology in aquatic ecosystems. While she has not worked with GLANSIS directly, she has utilized their data on Great Lakes native species to create educational tools for students.

- **Interviewer 4**

Interviewer 4 teaches intro level biology classes at the University of Michigan. Dr. Eidietis has knowledge about invasive species and wants to introduce it to freshmen students to give them a better idea of how the environment around us is and how we are influenced by species invasions. She is not a user of any kind of online database like GLANSIS, so we have a chance to know more about the requirements of a potential user.

Analysis Methods

We analyzed the interview result by creating an affinity wall. Data from interviewees were categorized so we can have a better understanding of the overall opinions about GLANSIS in different ways (see Figure 1).

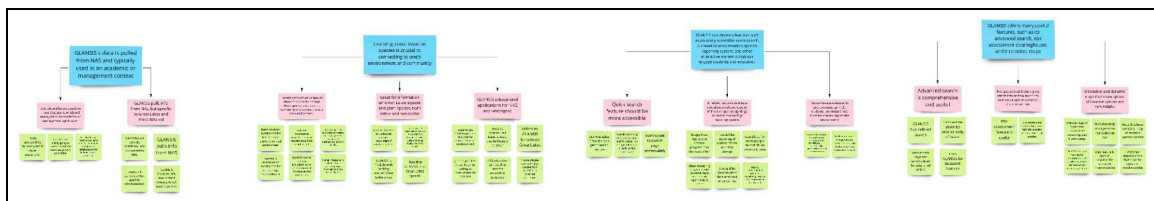


Figure 1. Affinity wall of arranged data on Miro.

From this affinity wall, we were able to create three user personas: an experienced ecology researcher, a high school science teacher, and an intro-level biology lecturer. Figure 2 shows the experienced ecology researcher user persona. From these personas, we developed scenarios that document how each of them can interact with GLANSIS (which can be found in the appendix).



Figure 2. Experienced ecology researcher user persona.

Findings and Recommendations

Summary of Results

Through our findings, our team found that the most helpful features of GLANSIS are the advanced search capabilities, the risk assessment clearinghouse, and the interactive maps that show invasive species in the Great Lakes area. The opportunities of growth that GLANSIS can explore are simplified ways of representing data to students, up-to-date information on the database, and a more accessible quick search function. These opportunity areas can be solved through interactive activities with specific examples, a crowd-sourced monitoring system, and a quick search functionality available on all pages (especially the home page).

Key Findings

1. The advanced search feature is comprehensive and useful especially to those experienced users.
2. The risk assessment feature gives ample information on a species.
3. The interactive and dynamic maps are one of the most helpful features.
4. There are many opportunities for building an educational hub in GLANSIS.

Amongst the data that we collected and analyzed, we have found the key features

that users find the most helpful from GLANSIS and similar databases. The advanced search feature is comprehensive and useful, especially to those experienced in the field of ecology and invasive species. It can narrow down by an area or a body of water, as well as by species characteristics and relevant keywords. In addition, the risk assessment feature gives ample information on a species. In particular, it tells the user if a species poses a high risk to the local ecosystem or if the species is not as big of a priority to address immediately. Finally, the interactive and dynamic maps are one of the most helpful features on GLANSIS. These maps are great to show both native and non-native species, as well as visualizing the spread of invasive species.

Our team also found many opportunity areas that GLANSIS can focus on for their educational hub. For educators, teaching students about invasive species is important to connect students to their local environment. It helps students understand the role that human interaction has played in introducing these invasive species into the ecological system. With clear examples, students can know how to prevent these species from spreading further and causing more damage. When looking at databases that contain reports on invasive species, the general public can be intimidated or confused by the numbers.

Another opportunity area is having up-to-date information available on the database. GLANSIS's data is mainly extracted from other databases, including USGS NAS, but is specific to the Great Lakes area. The rate at which data can be updated is dependent on the rate at which data is updated on these other databases. In addition, updating the data depends on scientists to contribute their reports in a timely manner and available staff to update the database.

Finally, the quick search function is not fully utilized on GLANSIS. To start the searching process, one of the participants chose to use Google to search the target species, followed by the key word "GLANSIS." It seems users take extra steps to get into the quick searching page of GLANSIS database, which is the most common function for experienced users. Because of this, these users tend to use search engines such as Google to search for invasive species information on GLANSIS.

Recommendations

1. Including a quick search bar on the home page and all other pages
2. Providing an incentive to contribute reports and data to GLANSIS
3. Crowd-sourced reporting system of invasive species
4. Built-in tools and pre-generated exercises

Based on our findings, our team has four main recommendations on how to best utilize GLANSIS's database. For experienced users, it would be useful to include a quick search bar on the home page and all other pages. This way, users that know what they are looking for can utilize GLANSIS's search function from any page at any time.

To achieve more up-to-date information on the database, two solutions are possible. GLANSIS can provide an incentive to contribute reports and data to GLANSIS. This way, scientists and researchers can submit their findings in a timely manner, which can give GLANSIS staff time to update the database. Another solution is a crowd-sourced reporting system of invasive species. As members of the general public come across invasive species, they can quickly report these sightings with a photo and location tag. With this, the dynamic maps can be updated with this information as it is submitted. This way, the database can provide up-to-date information as well as connect the general public to invasive species and make them feel involved in solving the problem.

Connecting students to their local environment through invasive species is crucial to stopping the spread of these invasive species. This can be done by including more interactive elements in the educational hub. This can include built-in tools and pre-generated exercises to introduce students to the impact that an invasive species can have on the local environment. For example, providing an interactive map and activity on rusty crawfish to show the impact and spread that this invasive species has on the local aquatic ecosystem. The general public can be intimidated by databases and reports. A summary of invasive species or a visualization of these data reports can also connect the general public to databases.

Discussion

There were some limitations associated with our study. We had a hard time gathering our interviewees, so in addition to the participants provided by the client, we sent out emails individually to biology & ecology professors at the University of Michigan. It was a time-consuming process and we gathered data from the last two interviewees much later than we expected. We could have conducted more in-depth research on each user interview and arranged them to make thorough recommendations. However, through this process, our team connected with educators that interacted with GLANSIS and educators that have not interacted with GLANSIS. Both provided key insights that led to our recommendations.

Conclusion

In this interview report, we conducted four user interviews with undergraduate biology educators for getting deeper insights and better understanding the possible improvements for the GLANSIS system, especially focusing on building an educational hub.

Based on our research, GLANSIS has many potential opportunities for building their educational hub. We, Jades Research team urges GLANSIS to consider these next steps as recommendations for improving their website in holistic perspective and for better contributing to the undergraduate biology/ecology education:

1. Including a quick search bar on the home page and all other pages
2. Providing an incentive to contribute reports and data to GLANSIS
3. Crowd-sourced reporting system of invasive species
4. Built-in tools and pre-generated exercises

We will continue our study next by conducting comparative evaluations and surveys on more users to get some more comprehensive data on the website.

References

- [1] Nielsen, J. (1994) Heuristic Evaluation. In J. Nielsen. & R. L. Mack (Eds.) Usability Inspection Methods. New York, NY: John Wiley & Sons.
- [2] Wagner, J., Lawrick, E., Angeli, E., Moore, K., Anderson, M., Soderlund, L. & Brizee A. (2010). APA Style. Retrieved from <http://owl.english.purdue.edu/owl/section/2/10/>.

Appendices

Appendix A. Stakeholder Interview Protocol

Appendix B. User Interview Protocol

Appendix C. Interview Transcripts

Appendix D. Personas & Scenarios

Appendix E. Affinity Wall

Appendix A. Stakeholder Interview Protocol

Stakeholder Interview Protocol

Overarching Question: What's your product and what do you want to improve your product?

- What are the goals of your website?
 - One stop shop for the aquatic species in the great lake region.
 - Peer Review lit collected synthesize it and keep it in one place. Stakeholder groups can use these freely as well as contribute to it as well.
- What resources/features do your user groups mainly utilize?
 - Scientists?
 - Educators/students?
 - Local/state resource management? (people who deal with plants as well)
 - Local agencies - not much use but possible target user group
- Where do you envision this website/database going in the future?
 - Scientists: bibliography, current mapping data, map explore: download the data and turn it into GIS content. Want to be able to put the s maps online. Why do they not share the information?
 - Which user group do you expect to use this more in the future?
- From your perspective, what is the success criteria for this project?
 - A sense for some particular audience, recommendations on what to add for that particular user group
 - Best practices on how they are reaching out to these people
- What questions do you hope to have answered?

Appendix B. User Interview Protocol

Protocol for: Undergraduate biology/ecology educators

Introduction: We are Masters students from the School of Information at the University of Michigan. We are working with GLANSIS to see how educators use this database and what information is useful. Your privacy is protected in this interview, and your name will not be connected to what you say during this interview. Are we allowed to record this meeting for our own reference?

Overarching Question:

What information do you expect to get from GLANSIS (or similar databases), and how do you want to get it?

Questions:

1. What concepts do you teach in your biology classes? Do you teach about invasive species in your classes?
 - a. If so, how do you utilize real-world examples while teaching about invasive species?
 - b. How important is showing real-world examples in helping students learn?
2. Have you ever used or heard of GLANSIS before? If so, what's your overall impression of it?

(Depends on the answer of the previous question)

For those who used it regularly:

1. How did you first learn about the GLANSIS database?
2. What do you mainly use GLANSIS for? And how do you feel about the function?
3. Think back to the last time you used GLANSIS.
 - a. Why did you use it? What information were you seeking?
 - b. What functions did you use in the GLANSIS website?
 - c. How frequently do you use GLANSIS?
4. Other than GLANSIS, do you use other similar databases? If so, can you tell us about the experience of using it?
 - a. (if GLANSIS has the function mentioned here) GLANSIS has the similar function, is there any reason for you to choose the other but not GLANSIS?
5. Describe any challenges you came across when you used GLANSIS.
 - a. Do you have suggestions for dealing with this problem?
6. Any suggestions for current GLANSIS personally?
 - a. Any new function you are expecting GLANSIS to have and why?
7. In relation to your research, have you ever contributed your reports or findings to GLANSIS or a similar database?
 - a. If so, which databases do you typically submit to?
 - i. How long does this process take?

- ii. How often do you contribute your data?
 - iii. When was the last time you contributed your work?
- b. If not, what stops you from sharing your reports or data?

For those who have no experience:

1. What tools do you use to connect your students to real-world examples of invasive species?
 - a. What are the reasons that you use that website or source?
 - b. What aspects of the website are helpful to you?
 - c. What would make this source of information more useful or accessible to you and your students?
2. What databases do you use for your personal knowledge to gain information about invasive species?
 - a. What are the reasons that you use that website or source?
 - b. What would make this source of information more useful or accessible to you?
3. In relation to your research, have you ever contributed your reports or findings to a database?
 - a. If so, which databases do you typically submit to?
 - i. How long does this process take?
 - ii. How often do you contribute your data?
 - iii. When was the last time you contributed your work?
 - b. If not, what stops you from sharing your reports or data?

For those with little experience:

1. When was the first time you used GLANSIS?
 - a. How did you know about the website?
2. When was the last time you used GLANSIS?
 - a. Why did you use it?
 - b. What functions did you use in the GLANSIS website?
3. What were the pros and cons of the GLANSIS website?
 - a. Were these pros and cons affected the frequency of using the website?
4. Are you willing to use the GLANSIS website again in the future?
 - a. If so, what are the reasons?
 - i. What was the most helpful/useful part of the website?
 - b. If not, what are the reasons?
 - i. What website are you going to use more than GLANSIS and why?
 - ii. Any suggestions for improvements of the GLANSIS?
5. Any suggestions for current GLANSIS personally?
 - a. Any new function you are expecting GLANSIS to have and why?
6. What other tools do you use to connect your students to real-world examples of invasive species?
 - a. What are the reasons that you use that website or source?

- b. Can you walk us through what aspects of the website are helpful to you?
- 7. In relation to your research, have you ever contributed your reports or findings to GLANSIS or a similar database?
 - a. If so, which databases do you typically submit to?
 - i. How long does this process take?
 - ii. How often do you contribute your data?
 - iii. When was the last time you contributed your work?
 - b. If not, what stops you from sharing your reports or data?

Appendix C. Interview Transcripts

Stakeholder Interview with Rochelle and El

Swathi Kumar

Well, good morning, everyone. Thank you for joining this call. So we just had a few questions, I think we're still deciding on the user group that we wanted to target. So we wanted to ask a couple of questions to just get some more information. And hopefully, by the end of this meeting, we'll have a better idea, we can meet up and let you know what direction we decided to head in. So what are your goals for this database website?

Rochelle

The goal of the database is to build ourselves as a one stop shop for information on aquatic invasive species for the Great Lakes region. So kind of all facets of what people living in the region, scientists studying the region managers working in the region need to know about invasive species, we want it to be here in an easy to find format. El, do I need to add anything more to that?

El

It's a big picture. So yeah, yeah. So what we do is we basically collect peer reviewed literature, from sources all over the entire region and kind of synthesize it and keep it here in one place. And so our goal is to be sure that our different sets of stakeholder groups are one aware that we exist, and to know that they can freely use these resources, as well as contribute their own research to us to have it hosted here so that it's more accessible to other audiences as well.

Swathi Kumar

Okay, awesome. Just to make sure we're on the same page, the user groups they have talked about in the last meeting were scientists, and then educators and students that might be using the website, and then local state wildlife management as well.

Rochelle

I would say, management is a little broader than just wildlife management. Yep. So I got people who deal with plants too.

Swathi Kumar

Oh, that's a good point. So as a group, we were able to go through your website and see the different pages, how they linked to each other. But we wanted to know, from your perspective, what features do each of the user groups mainly utilize? So for example, scientists would assume they would use peer reviewed literature as well as contributing their own literature. But what do you see that they would mainly, what features would they mainly use on your website?

Rochelle

I think the scientists are using the bibliographies, at least I hope they are. I think they are using the current mapping data. I'm hopeful that they're interested in the Map Explorer as a way to download the data sets and put them into GIS context. With some of the other layers that we make available there.

I'm hopeful that more of them will provide us with additional map layers. So things like you know, if they've done a project on habitat suitability, we want to be able to put their maps online.

And so far, they haven't exactly been jumping out of the woodwork to give us those things. It's more Ben. Oh, you have that? Can we please have one? Yeah, there's a lot of us sending emails and being like, hey, guys have some data? Can we use it rather than them being like, hello, we have some data, please use it?

Swathi Kumar

Is it more I guess, really, so they don't necessarily want to share, maybe don't have the time to share it?

Rochelle

I don't think we know that. Yeah, that would be a good thing to identify. I don't think it's that they don't want to share because it's like a net benefit to everybody in the region for this data to be made freely accessible. I don't think it's necessarily highest on their priority chain, though, to share it with a group that's not working directly on, like, sort of tangible outcomes. Or she'll stop me if you think this is incorrect, but like, outside of like, you know, audiences where they're going to use that data to like maybe do a management effort. So you have some invasive species of plant. It might maybe but they might more naturally share with other groups doing management control efforts, rather than a big database just collecting a whole bunch of background data, which is sort of where we are here.

And I would also say, you know, scientists are very driven by their funders, when they do outreach, generally, they're interested in doing the science and not so interested in what happens to it after it's done. Other than, you know, their university wants them to publish, therefore, they publish it. Because that's, you know, how they get tenure and promotion.

But there generally isn't a university requirement that they share it. Beyond publishing in peer reviewed literature, therefore, that falls to the bottom of their priority list, and they're onto writing the next grant for the next science project, not, hey, here's our data. Let's see how we can get people to use it. I just don't think they think in those terms, yeah, once it's out the door, the lifecycle kind of ceases to be relevant. Unless it can be used in other people's citations, I think. Which is a pity, because that's not really how holistic science works.

El

But that is how tenure track processes work. Yes, that is absolutely how academic publishing works.

Zaahra

I guess it shouldn't be seconds. What if it's okay? I'm just a follow up question. So you said you basically, like have to reach out to scientists, and I'm sorry, if I've missed this on your website, but is there like a process where they could get in touch with do instead or like, like a forum or something? There is? Okay. It's really just there on the front page, I think it says feedback. Or no, it says contribute actually, on the front page, I believe.

Rochelle

And that just pops up. You know, here's our email address, basically. But it kind of lists the things we were looking for. So correct. So it's usually just you guys basically reaching out to them and being like, yeah. Oh, yeah. We shall have folks, can you? Can you Rochelle talk a little bit about the ways that folks have reached out to you in the past, have there been people who have gone through the website and emailed you like, hello, I have a day. More people email me. Have I got a handful of papers? What is the research over the last few years with people reaching out to you rabbit?

So my internet connection is unstable. I just cut out for a sec. Yeah, sorry. I wasn't sure what was happening there, because you kept starting and stopping. But I wasn't sure if it was you or me. I do probably owe a couple times a month, on average, get some scientists sending me a paper that Oh, I was looking at this, and you don't have my research included. Um, and we're always happy to add those, you know, it's usually them sending me a paper they've written like, here's my paper. Data Wise.

Um, it's more likely that the state agencies send me actual data, as opposed to a published paper. I have a handful of what I consider my super user scientists who will send me data and or, Hey, you have this wrong type of thing. You know, the species that you have listed as a range expansion, I think it's native commentary. So we get some of that, um, I get occasional requests for data downloads less so now that people can do that directly on the website, which I hope means that they are downloading it themselves, not just that they've lost interest.

That tends to come more from managers or people in those quasi management agencies, rather than from people that I think of as academic scientists. So it might be a researcher at EPA or a researcher working on some puzzle with New York's Department of Environmental Conservation. So they're researchers, but not academic researchers. They're more affiliated with agencies who tend to be asking me for that kind of information.

Swathi Kumar

Gotcha. Thank you. I guess shifting focus then to local and state resource management, what features and resources do they typically use on this database? I've spoken to a good amount of it, but just to explicitly ask.

Rochelle

Um, we do have state agencies contributing data directly to us. That's usually the map data. The risk clearing house was built at the request of the state agencies. And I do occasionally get feedback from them to the effect that yes, this looks great. We are using it, you know, keep it updated. Or, Hey, I've heard that so and so has another risk assessment to include that yet.

So I think that's getting used pretty heavily by those people who are making permitting decisions. I do not think we are reaching the local audiences, say the lake associations, the cinemas and prisons, I don't think we are using it. And I think we have a lot to offer to them.

EI

Rochelle, could you define those terms?

Rochelle

Sorry. So cooperative, invasive species management areas are kind of like multi county units here in Michigan, and some of the other states have them as well. Prisons, I'm going to forget what the acronym stands for. But it's New York's equivalent of these kind of, you know, they basically divided the state into like six or eight regions, and they call each one of prism. But they're kind of like these more, more local management authorities. I think we have a lot to offer them, but I don't know what they're using at all. If at all, if they've even heard of us. Yeah, a lot of data in their hands that we could use, and help you know, that they would know who's what's going on in the, the unit next to them kind of thing if they all shared their data through us. We've talked about adding management layers, which I think would be of big interest to that group. But we don't have that yet.

EI

So for context, that's like what work is being done on say, so let's choose a random invasive species Phragmites, you know, there's big reeds that are always on the side of the road. Yeah, those are all invasive. But for the most part, there's a lot of management efforts that are going on to cut those down or apply pesticide to them, stuff like that. But this map layer would show where some of those management and control actions are happening. So people know what is being done around them locally, and can maybe share resources or even get involved if it's like a, you know, citizen science weed poll, or something that a local parks group has organized. So hopefully, that helps with some context for that.

Swathi Kumar

That helps a lot. Thank you.

Rochelle

That's a group. Um, within that segment, we're also funded through the Great Lakes Restoration Initiative. And so our funders are very interested in knowing how we support the other groups that they're funding. So you know, all the local restoration projects, you know, that they're restoring this or that Marsh, we haven't connected well with them. I think I hope some of them are using our data to guide their actions, but we don't have a sense of who or how much or to what extent or what additional data they would need for the Great Lakes Restoration Initiative. GLRI for short, also funds. Some species specific collaborative efforts. So there is an invasive mussel collaborative, there's a Phragmites collaborative, there's an invasive crayfish collaborative, there's a European frog bit collaborative, etc, etc. You name the species, the big ones, there's a collaborative route, which is all about information sharing on that specific species. I do try to sit on most of those collaborative boards. And so you know, I'm directly in the room and telling them, Hey, I've got the data here, use it or try to pull the data from those groups. But we haven't really worked with them in terms of formally asking them what do you need, what would be useful? You know, other than me sitting in the room and trying to figure that out based on what they're discussing. So that would be another group. I suspect that we are really most interested in the management components of our profiles and in the map data for those groups.

Swathi Kumar

Gotcha. Thank you. I think that also answers a follow up question I had of how you know, who would interact with the data on your website, but you're saying more higher level meetings that you work on?

Rochelle

Go to the collaborative meeting, to the Great Lakes panel on and to the International Association of Great Lakes research annual meeting, you know, I'm present on our database in those kinds of forums and you know, give them a formal update. Here's what new products we've added. But it's somewhat hidden Miss who all is there verse yet, in any particular meeting? So? But yeah, it's all anecdotal word of mouth. At this point.

Swathi Kumar

Great, thank you. So shifting focus a little bit more time, I think, just the last user group you're talking about for educators and students? What resources and features do they typically use? What are you aware of?

El

Yes, so I just ran an educator needs assessment last year, sort of through late summer, early fall. And educators kind of use a random eclectic assortment of things on our site. We do have collections of links that, you know, link out to specific activities or things like food web diagrams that they can print and use in their classroom as handouts. We have posters that we send to classrooms, sometimes that lists like all the 188 species that we track in the Great Lakes. So a lot of the printable kind of things and like actual physical materials, they

also use just the list generator, and species profiles to see what kind of species might live near them to talk about in the classroom and gather some background information. A lot of them when in our discussion, they were very interested in the Map Explorer, but didn't really know what to do with it. And so yeah, sort of an eclectic patchwork of ways that people get onto the site and use the resources that we have here. So based on their feedback, one of the two of the main things that we're implementing here are one, we're hoping to build an educator hub, is what we're calling it, which is a much more, I guess, descriptive link, round up, sort of describing some of the resources that we host and whether it's our own, or the ones that link up to external partners, so that it can all be in one place. And they know, sort of like what they're clicking through to and don't have to go digging for it. And then the other one is hopefully making some tutorials about how they can use some of the site resources, either for themselves as like lesson planning and background information, or to actually have their students play around with especially like, you know, the upper middle years and high school students to maybe play around with real datasets that are being hosted on our site here. And we don't have any specific lesson plans drawn out for those yet, but we're hopeful that we will be able to do that in the future.

Swathi Kumar

Gotcha, no, that's very helpful. Thank you. Okay. So just make sure I think the majority of our questions had to do with the resources and features on your website which are on your database and UI system. From your perspective, what would you see as I guess, the site success criteria for the end of this project? I guess what are you hoping to learn or gain knowledge about?

Rochelle

I'm hoping that we have a sense for some particular audience of, you know, like a short set of recommendations of things we could add that would make the database more useful to that particular group. Or even just to report back to our funders, people are using x and therefore we need to invest more in this component. Yeah,

EI

We only recently, like literally as of a few days ago, got access to the stats on what parts of the site people are actually using through Google Analytics. I think, is that correct, Rochelle?

Rochelle

Yes. And it's still in. It's still incomplete.

EI

There's some weird stuff with how the species profile information is actually generated, that means that we can't track which profiles are being specifically hit, which is very annoying, because it would be cool to see who's referencing what. But that's kind of a black box for us. But we can finally get a little bit of a sense of what other parts of the site people are using. We're afraid we don't have a lot of that data to share right now, because as previously

mentioned, it has been going on for less than a month. So we're hopeful that we'll be able to extract more knowledge out of that, but we're kind of, we're not really sure, aside from these initial surveys, sort of how people are using our stuff here. And honestly, if you maybe one of the things that we could work on as a group here is like, if you know of best practices and strategies for how we get that information from other user groups. So for context we're looking into in the future, how to maybe reach out to citizen science projects, we that's another group that we know is using our stuff, or that we would hope to use our stuff is citizen science initiatives. And then as Rochelle was mentioning, those regional kinds of management collaborative, so those FizzBuzz and prisms, maybe one thing that you could do is pull together sort of best practices for how people are going about reaching out to these kinds of disparate user groups. These days, I have a bit of a social science background. So I've been the person in charge of doing all this. But for me, it's just basic snowball sampling. So if you guys have like tips and tricks on like, network analysis, how you actually get people to respond to surveys or email, things, maybe that could be a component of the project here is like, what are best practices going forward for how you would recommend reaching out to a series of disparate user groups here? Does that seem like it would be within the parameters of your project design?

Swathi Kumar

I think so. I definitely think so. Cool. No, thank you. Thank you for answering. I think that gives a good structure for what we should be focusing on as well for the rest of the semester. Yeah. I think that is all the questions that I have. I wanted to open up to my teammates. Do you have any other questions that I may have missed?

Zaahra

Not really, but just to circle back on what you just said, oh, what would you read in Priority about? So you said, um, what I got from that is two things. One recommendation on what to add for a particular user group on the website? And then the other would be the best practices on how to reach out to people. Um, is there any priority? Do you think you have priority for either or, or?

EI

I kind of think that the first one, if possible, should come first. Like I said, I have some background with doing this. But also, it's been 10 years since I took any classes on it. So maybe strategies have changed. I would love to pick your brains, since you guys are kind of like doing this a lot more recently, here, and maybe there's new tools for networking and ways to kind of like, bring people in and get them to connect with us.

Rochelle

Well, and sometimes that can even be a question for us, you know, if you're doing a survey for us, you know, to ask the user group, where do you get your information? Now, we've used that on some of our past surveys to get a sense of, oh, you know, they're going to social media, or they're going to random web searching. So you need to make sure you come up

high on a Google search, or they're depending on word of mouth. Are there particular conferences that maybe we should think about setting up a booth there to get our stuff out? So that kind of stuff would be useful? To find out, you know, how do we reach you?

EI

Right, so I guess where this falls in, Rochelle and I have been working on some strategic communications plans. And so Michelle, maybe you and I, before these guys meet next, should go through and see which of the points in those plans that they can help us address what the resources they have at their disposal. And sorry, we didn't get to that a little bit sooner. We literally just finished pulling that together. Yesterday afternoon. Yeah, yeah. Cool. Yeah. Rachele, how do you feel about that as

Rochelle

Yeah, we can share that as a rough draft right now. I will say I see what we have so far as a rough draft. I mean, we're still sticky notes on a jam board. But yes. Yeah, if you'd like Gotta inform what we're kind of looking at for the next couple of years working on and you know, what kinds of questions we need answered.

EI

Yeah, let me drop that in the chat real quick. A lot of this isn't necessarily going to make sense, because there's a lot of acronyms and referencing stuff that is very, like, our user level specific. But it might help provide a little bit of context here.

Zaahra

Great, we appreciate it.

EI

Rochelle? Remember that conversation that we had yesterday about social network mapping? Maybe that's something that the students could help us with?

Rochelle

I think that's bigger than what they're going to be able to do through their class. Okay. Gotcha. Because they have very specific milestones to do with doing a survey, they will do a survey is my understanding, and, you know, so they need to be able to delve directly into a particular user group. Great. So yeah, I don't, I could be wrong. You know, kind of, you know, who all the players are, but you know, I, yeah, I don't want to go down that rabbit hole, I guess, if it will take the students too far from what they need for their class.

EI

Okay. If there is a group that I think we should maybe try to survey next, I know that we had the connection with Gary Krasner of the one particular SMA. He might be a point to start with snowball sampling. And maybe I mean, that's a connection, he seems very willing to

participate. And that might be a good point of contact to work out if you guys need to run a survey, at some point have a specific group?

Swathi Kumar

No, yeah, no.

El

Yeah, no, I apologize. Here, we went in with some very vague concepts of what we wanted to work on here. So we don't have a specific mission for you right off the bat. We're kind of generating this as we go along. But no, this conversation has been really helpful to sort of thinking through some of these next steps, yes.

Rochelle

You know, because we haven't surveyed, other than very broad brush, you know, we haven't done surveys or needs assessments, you know, to the detail that we want them on any of our groups. At this point, I wanted to leave it open if you guys had a particular interest in, you know, some aspect. You know, if you're more interested in the education versus the management versus the scientific audiences. We're happy to go with that. Because we don't have any of

Swathi Kumar

Gotcha. No, I appreciate it. Honestly, that definitely seems like a very structured project. So I appreciate the flexibility in choosing a user group as well.

Zaahra

Cool. Yeah. And I think we don't have to, like, we don't have a particular preference for any user group. But of course, like, since our first assignment is like, interview, so whoever is, like we are available to be interviewed, that would probably be the best. And like, whatever, we could get the most information out of one and two, whatever would be most useful to you guys, I think would be best would be the best option in my eyes.

Swathi

If no one else has any other questions?

El

Thanks for asking these guiding questions here.

Swathi

Of course, it's been helpful for us speaking with you and getting to know your user base more and more. We appreciate your time. Jiyeon, did you have a question? I saw you had unmuted.

Jiyeon

Yeah, it's not really related to the usage of the website, but just a real quick question. I wonder what cycle the GLANSIS site is updated in design aspect?

Rochelle

Design is very much ad-hoc, depending on what we get for funding each year and what else is going on. Nothing on the database, content-wise, is older than 5 years without having been through a review process.

EI

Raw data gets updated relatively recently. The website gets updated on an as-needed basis, based on if we see something screwy with usability, we're like oh this would be easy to implement and we have time for someone to program that in. Because we do not have a dedicated programmer right now, we're sort of stuck in a queue or working on what one of our teammates can manage internally.

Rochelle

But still, there's a lot we can do, even within our available manpower, and our grant proposals to Great Lakes restoration initiatives. We're putting in proposals. Well we're writing our 2024 proposals which funds 2025 work, so it's from us requesting funding to us actually having funding is a 3-4 year cycle. But we don't let that stop us.

EI

Yes, it's a long timeline but it does actually get done.

Jiyoona

Okay, thank you so much!

Swathi

Within the next couple of days, we will chat as a group and let you know which user group we want to focus on, and we can move forward from there. Thank you to both of you for taking the time to answer our questions!

Eugene Braig

Dongyu

So the first question. Well, we want to know what concept you teach in your biology classes. And do you teach about invasive species in your classes?

Eugene

Yes, I teach fisheries management, fisheries biology, and absolutely there it's not a long session, but I give a day often, too, because it takes me longer to get through that lecture because it's meaty to get through invasive species.

Dongyu

Okay. So in your classes, do you connect the concept do you teach to real world examples, like, in particular, about the invasive species?

Eugene

Can you repeat that? I'm not sure I get the gist of what you're asking.

Dongyu

Okay. So do you connect the concept you teach into river example? Do you take out one of the invasive species as example, like from any database and ask or teach particular thing as example to your students?

Eugene

So I certainly use examples. I don't necessarily extract them from a database, but I'm familiar with the information in the database, and I might refer to the database myself to update information. So there's also I probably should have mentioned this. In addition to a section specifically on invasive species is a section specifically on the Great Lakes. And I review a fair amount of information regarding the species who have invaded the Great Lakes. Of course, a lot of that information is documented through GLANSIS.

Dongyu

Okay, I see. So do you think is it very important to have these examples for your teaching?

Eugene

Absolutely. Yeah. I mean, I'd rather I not have them. I might as well exploit the fact that they are there and maybe in doing so, maybe prevent the next one from coming along.

Dongyu

Yeah, I understand. So let's go to GLANSIS. What's your overall impression of the GLANSIS? Because we know you're a routine user.

Eugene

Well, I'm a routine user because I like it. I think it's a valuable database. I understand that most of the database is not GLANSIS database.

Eugene

That is mostly an interface to access the USGS NAS database, but I like its search features, how flexible it is around the Great Lakes, and how Great Lake centric it is. I do like, too, that GLANSIS, of course, includes some information that isn't on NAS that especially relates to plants.

Eugene

Nas doesn't always update so quickly regarding invasive plants, and Glances often has pages on those plants when Nas does not. And I'm assuming that you're familiar with NAS.

Dongyu

Well, personally, I'm not very familiar because we just know it from the start of the semester. We don't have much time to explore it enough.

Eugene

Okay, so most of the information that GLANSIS has is pulled from the NAS database interface I've just sent up a link, if you're curious.

Dongyu

Thank you. So you're talking about it(GLANSIS)'s actually using another database for their data, right?

Eugene

Yes. It largely pulls data from the NAS database, but there are some species that NAS does not cover that GLANSIS augments.

Dongyu

Okay, so do you think it's locally more precise because they are pinpoint to the great Lakes area.

Eugene

So the data are almost always the same that they relay. Although, again, if there is some information that's missing, Especially on aquatic plants From NAS, It might be augmented by GLANSIS. I wouldn't say the data are more precise, but perhaps there is additional information available through GLANSIS sometimes where it's not on that. And again, I use GLANSIS Mostly because of its nicely. What's the word I'm looking for? That I can refine search features for the grid.

Dongyu

I'm not sure if you're hearing my outside is, like, annoying.

Eugene

No, you're fine. The filters are working and all I have.

Dongyu

Okay. Okay. Thank you. When was the first time you used GLANSIS?

Eugene

Oh, boy, I have no idea. Probably about the time it was invented was before then. There was a workshop at stone laboratory that I participated in to organize some database that was run by Rochelle Sturtevant. And of course, if you haven't spoken with Rochelle, you should.

Dongyu

We did. Yeah, well, she's actually our client, so basically, you know the database through her directly? Yes.

Eugene

Okay, so we had this way back when we came up with this acronym. Nice dog. I'm not sure I can remember what it means, but it was pre GLANSIS.

Eugene

And I think GLANSIS Ultimately came out of that.

Dongyu

I see.

Eugene

While we're speaking, I'm kind of looking for what that means Because I email folder somewhere about it.

Dongyu

That's a different story.

Eugene

Yes, quite.

Dongyu

Yeah.

Eugene

And there's no a in there, so it's actually this.

Dongyu

Nasty WG. It's hard for me to connect it with GLANSIS, but it looks very different.

Eugene

Yeah, I'm trying to remember what and I remember it's non-Indigenous and intensive aquatic species, But I can't remember what DWG was.

Dongyu

No problem. Can you remember what's the last time you used GLANSIS?

Eugene

Well, again, I'm not sure. It's relatively recent, and I probably went. Boy, I just don't know. I often search Both GLANSIS and the USGS NAS database simultaneously. And again, I do it

with such frequency, I can't recall exactly wasn't last week, but it probably was in December or January.

Dongyu

Okay, I see. Last time you use it, what are you using it for?

Eugene

Don't know. It probably would have been to be searching the range of expanding things. Some recently expanding things that I've been watching are Rusty Crayfish, European frogbit, Yellow Floating Heart, the pond Loach. So all of these are possibilities. And it's hard to say Because I look for information like this with some frequency.

Dongyu

Okay, so you recall some... I assume they were all biology names I'm not familiar with, so what's the common properties of them?

Eugene

Well, the only thing they have in common is that they're invasive, right? They're not native here and they're spreading. So... Frogbit and Yellow Floating Heart are plants. Rusty Crayfish is an invertebrate, and Loach is a fish

Dongyu

Since you use it one or two months ago. Can you walk us through how you use it now?

Eugene

So it depends. I will sometimes go to the main search page and narrow by watershed or Lake. However, more commonly I will type GLANSIS and the species I'm looking for in Google and let it take me directly to a fact sheet page on GLANSIS.

Dongyu

Okay, I see. So other than GLANSIS, you mentioned about the NAS database, right? What do you say the difference of the using experience comparing two databases?

Eugene

They're very similar. The data they include is usually identical, usually with some exceptions. And I will look at NAS for getting North America wide perspectives. And I will look at GLANSIS for perspectives specific to the Great Lakes or for use of the Great Lakes specific search feature.

Dongyu

So can I say your reason of using both of them are to compare the data to make your information more precise or not?

Eugene

No, it depends on where I'm looking for information.

Dongyu

Okay.

Eugene

One information specific to the Great Lakes GLANSIS is more likely to have it. I want general information on the species. NAS will usually suffice.

Dongyu

Okay, I see. So do you have any challenges or problems when you're using the GLANSIS?

Eugene

It's hard to say. I rarely look at things looking for problems. I usually just use the things that provide me the answers I would like to have. And if they don't have it, I'll look somewhere else for it, right? Well, I'm not sure, I guess... When I visit Glances directly, I do have to take a couple of clicks to get to this. Usually when I go to Glances, I just want to get right to the search page, right? And just searching up Glances on Google, I suppose I could simply bookmark the search page, but I never do, right? Jump through a couple of clicks before I get to the actual search features. But that's trivial, right. And that would be solved with a bookmark.

Dongyu

Do you have any suggestions for the current GLANSIS? Personally, what do you want from them? More?

Eugene

Oh boy. I suppose the one thing that I would like from all the related databases is more rapid update of information as things are changing, as ranges are changing and moving. But that requires staff time, right? Which things rarely have. It also requires people to input reports, and not everybody in the field is putting in reports.

Dongyu

Right.

Eugene

So these databases depend upon limited staff. I'd love them to have more staff reports from the field by people who don't work for them. And I wish that more agency biologists in particular who are in the field staff had the foresight to upload their reports to all of these databases.

Dongyu

Yeah. So for GLANSIS, I see the contribute page, but I think that's kind of function about it. Is there any reason to mention about it because the other database do not have similar page like contribute or that contribute page has a limited function.

Eugene

So I think most of these databases do. And GLANSIS is a little unusual, again in that much of the data doesn't live at GLANSIS but is extracted from a different database. Oh, sure. So I'm setting up another link. For example, if I am in the field and I make an observation of a thing in a place where it wasn't before, I'm likely to report it here. And when it's included in the NAS database, if it's also within the great Lakes watersheds, then GLANSIS will draw those information.

Dongyu

Right. I see. Yeah. Basically that's all the question I have for now. Swathi, do you have some additional questions to ask?

Swathi

Just to reiterate, it seems like the search function and the search functionality and being able to refine your search is one of the main features that you use from the GLANSIS website. And why do you like using it?

Eugene

Yes, I like it because I often think about the Great Lakes and I like that it's so very Great Lake specific, right. That I can narrow it to a Lake. I can narrow it to the Lake directly or the watershed around. I like that it distinguishes among organisms that are native to North America and spreading outside of their historic range and organisms that aren't native to North America at all. Right. So I like all of its layers of categorization and layers available in the search feature.

Swathi

Got it. I appreciate it! That was the main question that I had.

Eugene

Of course.

Dongyu

Yeah. I think that's all for today's interview and you have a great day.

Eugene

Great. Thank you and write or call if I can be of further assistance.

Dongyu

Okay, thank you

Swathi

Thanks for your time this morning. Really appreciate it.

Eugene

Certainly. Good luck with it all.

Swathi

Thank you. Bye.

Donna Kashian

Jiyoona

First question is what concepts do you teach in your biology classes? Do you teach about invasive species in your classes?

Kashian

Yeah. So a lot of my classes... So I teach aquatic ecology... I'm trying to think ecology in the environment and ECOTOX ecology and then some diversity classes. But in both the ecology type classes, Aquatics and ecology and the environment, we have entire modules and invasive species.

Jiyoona

I see. So like in your classes, biology classes. So do you connect concepts to real world examples, like in particular about some species?

Kashian

Yeah. One example is the Great Lakes are obviously a very good example. And I try really hard not to just do the Great Lakes, but things like I use many examples from the Great Lakes, but one of the ones I like the most, and even when I do K through twelve, I use it. USGS has the active maps. I don't know what the word for it is. The maps where you can actually see it starts in the first zebra muscle comes in and then you have dots. So people are actually seeing like the real time development of the spread of zebra and quagga muscles across the US.

Jiyoona

Oh, I see. Have you ever used or heard of GLANSIS before?

Kashian

Yeah, I actually helped there's two years where I had post-docs. They actually did a lot of work on GLANSIS. We found it through the Great Lakes Restoration Initiative. We did the surveys of collecting data on novel species. We made the playing deck of cards with the GLANSIS species for outreach and education of species that had not yet arrived. So that was all through GLANSIS work supporting GLANSIS.

Jiyoona

Oh, I see. Then do you still use GLANSIS regularly?

Kashian

You know, I never actually use it. It was more of us contributing to it, to the GLANSIS database. Yeah, I actually don't actually employ it in my research.

Jiyoona

Okay, so you have never experienced GLANSIS database yet, right?

Kashian

Well, we contributed to the database. I know we have class projects and I let the students pick up... I give them examples of data sets, but I don't know if any ever picked the GLANSIS one to work with, but it's an option.

Jiyoona

Oh, okay. Yeah. Just for an option then. Is there any database tool that you use more than GLANSIS?

Kashian

No, the only other one that I was... I guess we're using a nutrient database... I'm trying to think about the term tool. There are databases we use with community science, like the

Rouge River has a citizen science database, and we've used that database to reflect on citizen science program. So that's one database I've used. In classes, I go to a lot of different data sets and allow students to be able to ask aquatic ecology type questions using them. The other database, that probably the Habs one. It's like a forecasting, one that I know students have also tapped into. But most of the time they actually use databases that our lab has developed or other labs have which are like more Excel type spreadsheets because that data, the type of analysis they're doing is usually... It's set up in a way that they can do mean median like basic T tests and stuff like that on the data. And GLANSIS, I haven't seen data that makes it easy to use like that. But I could be wrong. It could be there.

Jiyoona

Yeah, maybe you're right. I mean we are also not really familiar with GLANSIS yet because we just knew it for our project from the beginning of the semester, so we're getting familiar with it. In your opinion, what is the most important aspect of those kind of website? I mean those kind of database.

Kashian

I think data accessibility for everyone is super important and I know when we say everyone it really ends up being mostly academics that use those types of databases and management DNR that use invasive species once more often. But we would like to think that databases like this are used more for the general public. I think the Habs one sometimes is used a bit more by like charter fisherman applauded to go out when there's a Bloom for invasive. It's a bit different because for the traditional person the impact of an invasive here and now doesn't affect their lives, right? Like a harmful alga affects a fishermen, a fisher-person, going out to different areas. So I think the data set is mostly going to be an academic and then some management applications.

Jiyoona

So maybe I don't know well about it but is there a lot of differences between the database for academic people and general people?

Kashian

No, I think academics like to believe that our data sets are useful to people but I think very seldom do people actually access databases like that because we like the idea of science, communication and getting the information out of there. But maybe K through twelve they're using it as part of educational programs. But in general, even watershed, I'm trying to think of subdivisions who manage Lakes, watershed groups and those local communities. Those are the only ones that might and even that I think most databases are overwhelming. And then for the general public what are they going to do with the invasive species one? I mean it's kind of more like just the acknowledgment of species being out there. So it does lend itself to being to me in my opinion almost strictly academic.

Jiyoona

Yeah, I got it.

Kashian

And government research which I kind of classify is the academic research bound.

Jiyoona

Okay. Yeah, I see. How can I say let's say you're going to use GLANSIS in the future for some reason. Is there any specific function you are expecting from GLANSIS database?

Kashian

Knowledge of who is not here yet and the physiological requirements that would allow them to be successful would be useful mapping... Like I said, because that's the map... I like the mapping being able to look at where things are and where things may end up. So how similar species. So I do think mapping has a broader use than just data in a lot of ways.

Jiyoona

Okay. I think with our interview protocol we wrote, so, Zaahra, do you have any questions for..., our teammates, do you have any questions?

Zaahra

Thank you for all the information. Super helpful. I just wanted to follow up. So I know you said you don't really use it, but do you think you have any suggestions or anything that you thought of when you were contributing to it? It could be about the contribution process to or about the website.

Kashian

I do think always keeping in mind and I haven't looked at it. I haven't honestly flipped through the website in a while and I kind of didn't want to before this interview because I didn't want it to taint me in case part of it was like, what do I know? But I do know that the risk assessment kind of component people fall short on a lot and understanding that just because something comes in, it doesn't imply it's going to have a huge risk and always making sure for every species to the best of our ability to do a risk assessment on what those species are and that is what we were doing when we contributed to that. But I'm a tax College, so that's why I thought that's something that I think about all the time is the risk assessment piece.

Zaahra

Right. And how long has it been since you contributed to the website?

Kashian

Alicia was my post-doc. Alicia, Abigail... Alicia Davidson and Abigail Fusaro, if you say anything with their names, that was our stuff. So it's probably been about six years, I'm thinking.

Zaahra

Okay, got it. Those are my follow up questions. Do you have any more that you can think of?

Jiyoon

I don't think so. We covered all of the questions we made before.

Kashian

And feel free to email me or if there's additional things after talking to other people like "oh, I should have asked that." Feel free to email me and I'll be happy to answer them.

Jiyoon

Yeah, sure.

Zaahra

That would be amazing.

Jiyoon

Yeah. Thank you so much.

Kashian

You're welcome. Good luck with that.

Zaahra

If there's anything that you want, tell us, let us know. We're doing this for the whole semester.

Kashian

Okay. Great. All right. Take care.

Zaahra

Thank you.

Kashian

Have a good weekend.

Jiyoona

Thank you.

Carly Nowicki

Swathi Kumar

Your name won't be connected to anything that you say during the interview, it's just for the sake of collecting information. Thank you so much again, for jumping on our call. So we're both masters students at the School of Information. And we're working with GLANSIS to see how educators could potentially utilize this database. And so I guess let's just jump right in. Yeah. So what, in your Ecology Lab, what sort of concepts do you typically teach?

Carly

All of them?

Swathi Kumar

I guess, in relation to invasive species.

Carly

I have been quite, kind of tied into it. Because, so the specific lab that we do, where I talk about invasive species, is at Urban Birds lab. So it's not directly gonna be use GLANSIS. But during that lecture, we're giving kind of a pretext to it. And general ecology, I don't think they spend a lot of time talking about invasive species. And it's kind of, one of the.. really large anthropogenic influences that we don't talk about. We talk about climate change, we talk about contaminants to talk about that stuff. But one of the other big pillars of anthropogenic influence and human disturbing the environment is the movement of invasive species. And sometimes that can have an even larger impact than chemical contaminant burdens. So while chemical burdens are coming, you know, obviously, like a chemical biological or biological degradation is a big problem. So, because I've tracked it in many different ways in the Great Lakes. And so I, really, how I use it is just a mention of it. But I'm actually glad you brought this up, because I wanted to kind of expand on it. And I'm like, ha, you've got me thinking about a project that I could do using GLANSIS because I have done it in other courses where we've had students who've had to research.

This was when I was at Wayne State a long time ago. But we like to have students have to investigate an invasive species and talk about and come up with a project proposal of how

they would mitigate that invasive species. As we're learning more about it, I have also, even in my own graduate work, taken courses that work with GLANSIS, that was of my PhD advisor, (her advisor name), this is what she does. So, she was a NOAA global scientist. And then her lab specializes in aquatic invasive species. And she worked very heavily with GLANSIS. So that's what I.. so, basically, it's that class that really, it's that lab, that Birds lab, but it's not focusing on GLANSIS. We also have a separate part of it. Another lab that is an aquatic ecology lab is the last lab that we did in semester, which we haven't been able to do because we have been virtual the last two years. So I'm hoping to launch it for the first time this semester, where we are doing benthic invertebrate stream surveys. We're going out to two different streams in the area. And they're going to identify different aquatic species in the streams. And inevitably, there are invaders that they will find while they're there. So, such as the rusty crawfish, but definitely find zebra or quagga mussels in these areas where the quagga mussels typically, clog the muscles in this area. So they'll get to see that as well. So yeah, so those are probably the two labs that will have that as part of it.

Swathi Kumar

Great. I think you answered a couple of the questions, follow up questions I had for that as well. But I'll go ahead and ask this last one, you know, how important do you feel it is showing these real world examples in your classes to help students learn?

Carly

Yeah, so, I think we spend a lot of time teaching students concepts and doing a lot of the traditional labs. And part of the reason that I lost the government position is obviously I like to teach a lot more I teachings when I'm more interested in educating is more, is more interesting. But it's like, you even see students that are coming out of the college level, you know, coming out even bachelor's degrees, and they really only know the basic concepts of ecology and their application is look lacking. So, we need to get the students out of the classroom and out of the lab, and have them actually applying real world things and applying for real datasets. So like even this Urban Bird lab that we do, we're doing it in conjunction with the Cornell monitoring program. So that they're providing data to a real dataset that's being used to monitor invasive species. So I think that being able to do this same type of thing would be interesting. I think it's been a while since I played around on the GLANSIS website, but I know I've done a GLANSIS risk assessment before, I took actually an invasive species risk assessment course workshop that use GLANSIS specifically for us to do a risk assessment, looking at certain species, but what would be really great is, if glances built in some sort of monitoring thing like that where you can report. So, while this is an information system, that would be really great if there is a location to be able to report species that we have found, or where education entities can interact with this website more

and have activities. So I know there's a risk assessment activity which I have done before for sure, but it tends to be a little dense and they really should do something where you can enter data and do stuff like that.

So I was gonna say I'll show you like the CUB website, you can see what they do. Just give me one second to get that to you. (<https://celebrateurbanbirds.org/>) Alright, so, for example, CUB, called Celebrate Urban Birds, they call it CUB. And so it's a monitoring program. But if GLANSIS could do something like this, sorry, I'm just trying to get to like, I've got words linked into my area. Those are the part of Cornell Lab of Ornithology.

So, it's a program it's a, so again, being able to do community scientists, when you have community science where you can actually have people in the community going out and looking for the species or monitoring the species, or have something where like an elementary school can interact, they can do a lab, you know, and it doesn't have to be out in the Great Lakes, we often think that they have to be out on the big water. But the Great Lakes watershed is included in GLANSIS. So there's no reason they can't go and search in the Rouge river or the Huron River or because the invaders are all there. Or a lot of them are. So they won't take a look at a lot of the fish, a lot of the plants, a lot of aquatic invertebrates are all there.

Swathi Kumar

gotcha, I appreciate you sending this website as well.

Carly

I mean, if you have to dig around a little bit, but if you go to like the about page, and you know, you can go to learn and things like that. And you'll see there's data so you can go to like, over the data and click Get Started. And this is where you can enter data. And they have a whole program teaching you how to track something, or track a stream. And so GLANSIS could have something where they select a stream and you say you're going to take your class out and you're going to monitor that do a basic aquatic invertebrates monitoring program, for example, is a great way to do that. The great aquatic invertebrates monitoring programs are done by a lot of different organizations, like friends of the Rouge River has their own aquatic and vertebrate monitoring program and has lots of community facing plants. So that they had the community be part of the monitoring all the time. So citizen science is a really big, important thing. So I think if you want to have people interact with it, you gotta make it

useful to doing that. So I think if they had some way where we could enter data where we could track what we find and enter data, it would be great.

Swathi Kumar

It should actually, that answer answered a lot of the different questions that we had. So I appreciate that. So jumping into specifically the GLANSIS database, it looks like you use the risk assessment feature. What other features do you.. when do you last.. were using it pretty regularly? What other features do you remember using?

Carly

Definitely I've used the maps before, I think the maps are really helpful maybe just because it's a visualization of it. I mean, I've gone through here before and gotten datasets especially if I need to, like investigate a certain very specific species and you know, pops up all kinds of stuff. So that's what's really nice about it. Yeah, I mean, it's been a little bit since I've dug around in here and it might have made the biggest thing I know, I know I've used the maps on my own research and definitely liked it when I need to get a basket of zebra and quagga mussels. I thought I've always gone here to kind of find some but yeah, I guess I dabbled in it a little bit any time. So again, as I was looking at this before our meeting, they've definitely advanced their website a bit more than when I first went the last time I was on here.

Swathi Kumar

Other than GLANSIS, do you use any other similar databases when looking at the invasive species?

Carly

Besides like a raw Google search, I use the USGS a lot just because they've got a lot of GIS based information. I used to work there. So I'm just familiar with it. So I used to use the USGS website before, but I mean, it's been a while, because I've been in education, actually, for the last 10 years. So it's been a bit since I've been having to really research invasive species. So it gives me ideas now, since that you guys reached out to me.

Swathi Kumar

Great. I guess that in relation to your research, have you ever contributed your reports or findings or data to similar databases or even GLANSIS? Or something similar to just transferring that what you were saying before like giving that data and potentially updating in system?

Carly

I think USGS did. You again, USGS has a lot of its own monitoring programs. So in my own research, so in my position, now I don't do research here, I actually switched over to education, because I'm more interested in curriculum developments and research. So I do a lot of my... by switching from being a scientist to really I education is what I was interested in. So I do a lot of science, lab development and curriculum publications. So I haven't really been doing a lot of monitoring with invasive species in quite a while. But I guess the only thing is for USGS, like, I can't say that I've loaded any information to GLANSIS.

Swathi Kumar

Gotcha. Gotcha. I think one follow up question that I have, I think we're kind of nearing the end of the questions. But since you're focusing a little bit more on education, you did mention the website could do better at making a little bit more interactive. Do you have any similar ideas of making GLANSIS a little bit more interactive? Maybe the students as well, not just educators?

Carly

Yeah. And I think that.. I think, I mean, obviously you gotta give resources. So like, if you have tools built in or exercises that are pre-generated and built in it'll get people to start digging through the databases more. And having.. again, having a citizen monitoring program or a location where citizens can upload data is kind of what I would recommend. I mean, I know you can share data and stuff like that. I don't know how.. But I think those are.. it's just not as.. like straightforward. I feel like you gotta like.. I don't know. You need something that is.... I don't know.. some sort of.. maybe not even at the college level. It's not up for the college level students, so yeah, I even looking at this, looks like they've increased this a bit so that you can more easily report things with them. It looks like you can do, but almost like.. if you look at the Celebrate the CUB website, like just something were, those were even kind of kid

friendly, if you will, where it's something where it's a real easy citizen monitoring program that's done regularly.

Swathi Kumar

Absolutely. All right. I think that was all the questions that I have. Jiyoona, do you have any follow up questions or anything?

Jiyoona

First of all, thank you so much for participating again. And I was actually a note taker, so I didn't have like, a chance to talk with you, like interact with you. But anyway, I think we're almost done with our questions. And I don't really have a lot of like, follow up questions so far. Yep.

Swathi Kumar

Great. Thank you. Anything from your end, Carly for anything you wanted to add or anything else that you wanted to share?

Carly

No, I don't think so. But I think it's good that you guys are doing this and making it more public facing. I think that's great.

Swathi Kumar

Thank you, no absolutely, perfect. I'll give you back your Friday but thank you so so much for interviewing with us.

Carly

Yeah no problem. Best of luck with your work.

Swathi Kumar

Thank you, have a good one.

Carly

Yeap

Laura Eidietis

Swathi

Alright, so first we wanted to ask what sort of concepts do you teach in your classes, specifically about invasive species?

Eidietis

About invasive species? I teach a couple of different classes, so I was thinking you might be interested in my biology 108 class, which is a non major class. Right. So I teach a lot of this is an animal diversity class, but I teach some basics about sort of how animals interact with their environment. And so I teach about several different invasive species, but for the most part, it's to illustrate ideas in community and ecology. So as an example, I use invasive species to illustrate the concept of competitive exclusion because there are a couple of good examples of invasive species excluding native species from particularly aquatic environments. So I use that a lot. In that class, I don't teach... It's not like I have a lecture on invasive species. It's just we learn what an invasive species is, and then we learn what sort of effects they can have depending on the situation and such.

Swathi

Do you typically utilize any real world examples of invasive species during your classes?

Eidietis

I do, yeah. So an example is I use the rusty crayfish in Michigan and Wisconsin in Minnesota. So that's one example. We use zebra and quagga mussels. Right. We use example of Sparkling Lake, Wisconsin, which was a rusty crayfish invasion, and an inland Lake, which is a nice example because there are some nice data that you can use. So I have a data set that students take a look at. It's a pretty simple data set, but it's nice to see the numbers. So we use that. We also learn about sort of more broadly from an ecosystem perspective, some of the invasive species in the Great Lakes in terms of fishes and also sort of talk about, well, what would you call something like salmon? Are they invasive or not? They're introduced, so that's an interesting question at this point. It's an animal diversity class. We do talk about mollusks, but this one I use case studies. And so we talk about Michigan mollusks, and then we talk about invasive mollusks as invasive aquatic mollusks and how those can affect some of the Michigan aquatic mollusks.

Swathi

Got it. A lot of different examples. It looks like just to get.

Eidietis

Yeah, I do a lot of examples. Yeah. This is with the non majors. Having the examples tends to help them retain the information a lot better, actually.

Swathi

That leads into my next question. How important do you feel that showing these real world examples and classes towards helping students learn?

Eidietis

I think the real world examples are pretty critical from a variety of different perspectives. I try to use as many Michigan examples or Midwestern examples as possible to help students learn about the environment in place where they are living. And so for some students, that just makes it more relevant because a lot of my students are from Michigan. So it's just, oh, this is the world I live in. Right. For other students, it's a matter of sort of learning about the place where they are visiting for however long they're here and such. So I think it makes it more relevant. So I think they remember things more. I do use other real world examples. You were asking about invasive. When I talk about invasives, a lot of times I'm talking about mid Western invasive. So I use other real world examples that are not from the Midwest. But I have a sort of a professional desire to use as many local examples as possible to help students learn about the world that they're actually sitting here looking at and that they can take a walk out and see.

Swathi

Got it. That makes sense. So previously you had mentioned that you have your students go through data sets just we're involving these invasive species just to get more numbers view and data view of invasive species. So typically for their reference and for your own

reference, do you have any databases that you reference, that you enjoy going to, or prefer going to?

Eidietis

I don't I haven't had time really to do that. I, at some point, went looking for some, and that's where I came up with the sparkling like, data set. It's a nice, pretty easy to use. These students come in a lot of times. I have them as first semester students, and most of them are not science oriented at all. So if I throw too many numbers, it will just scare people. So I try to keep it with stuff that anybody could understand. So anyways. Yeah, but it would be... I wouldn't mind having more numeric examples in general, as long as I can get the numbers to be simple, basically. And there are some other things, too, that are nice. We've done stuff before with images where students have worked on some of the citizen science stuff, where you identify images. Right. And so if there were invasive species based ones like that, where you're identifying images to see what's the proportion of invasive species that show up versus other species or something. Right. That wouldn't be a bad thing for us to do. I just don't know of it. And I have limited time for development. So when I get an idea for a particular lesson, I go looking and it takes me a couple of days to find something.

Swathi

Got it. That makes sense. So our main project deals with GLANSIS, which is a Great Lakes area invasive species nonindigenous species database. And so we're not specifically looking for information regarding GLANSIS, but just individuals who kind of work within the field of ecology and invasive species. I just wanted to ask, have you heard of GLANSIS before?

Eidietis

It seems to me that I've seen it on an email go past my eyes, but I haven't actually looked into it. I haven't actually probably opened the page or anything.

Swathi

Got it. No problem. Let's see... So, a quick question. Do you, I guess, do any research regarding invasive species as well?

Eidietis

No. I'm a lecturer, so I don't actually have an active research lab right now. Got you. At one point, I was starting to work on some crayfish stuff, but that was a long time ago and it's long since that.

Swathi

Perfect. No worries. And I may be repeating this question, but just wanted to make sure I cover all the bases. But do you have any databases that you use for your own personal knowledge to gain information either about invasive species or just Indigenous species around the Michigan area?

Eidietis

I do not. It actually wouldn't be a bad thing for me to have tabbed, but I don't at the moment.

Swathi

Perfect. No worries. Let's see. I think that is the majority of the questions I had. Dongyu, do you have any questions that came up in the middle?

Dongyu

Sure. You said you teach your students based on your personal knowledge, and because you are teaching the first year students, you don't teach them too deep, something like that. So what kind of information do you think is the most important for the first year student to know how important that the invasives are?

Eidietis

So I focus on two major ideas. One is that the invasive species alter the inter specific interactions substantially and can cause localized extinction. So I focus on that. And the other thing is that the invasive species can change the flow of energy through the food web such that in a lot of cases... In the case studies where I'm teaching and stuff, it actually alters so that the native species towards the top of the food web simply don't have any energy. So it

just basically can decimate some of the higher trophic levels in the food web. So those are the two big things that I tend to teach about with those. Yeah. So if I were teaching... This is not a class that really has anything to do with social science, so I don't teach that much with it, right? But I would probably also teach about economic impacts, but I can't assume my students have the background knowledge to understand that and I don't really have the time to teach the whole picture of economic impacts.

Dongyu

Yeah.

Eidietis

I've also considered just to tell you because you asked what do I think is important is it seems to me that the invasive species must have cultural impacts also, especially in terms of native and Indigenous Peoples, right? But I don't know anything about that that's sort of outside of my realm of knowledge base. But it has occurred to me that this would be very important to think about. I just don't know anything.

Dongyu

Actually, the knowledge in our head is not complete, so we did some research before teaching, like Google or something. What kind of information do you focus when you do this kind of research?

Eidietis

So I teach intro bio, so I'm on the course coordinator for one of our big intro bio courses also. That's different. And I told you about the course that I have the most, like freedom in terms of pedagogy and what I teach and such. So I've done a lot of research into how to teach introductory biology concepts. Right. So I know about the case studies because I've been a biologist in Michigan for 20 odd years. Right. So that's how I know. So I read papers. I know what's going on in general. So I know why invasive species are important to biology because of my knowledge base regarding introduction biology. So I teach ecology, evolution, and genetics for the most part. In answer to your question, I read papers. I read views when I have time. Obviously, I've read a lot of textbooks, so every so often I have time to read something else also. But if I have time, I try to read review papers. Since COVID been here,

I've had less and less time. So I'm hoping that as we sort of get back to some level of normalcy, I'll have a little more time to do that. I find review papers to be extremely useful as an instructor to sort of get a bigger picture, get a picture of where the research is, because I'm not always terribly interested in what particular study is being done. I want the bigger picture of what sorts of studies are being done. I know there's also a lot of theory about invasibility and what causes some ecosystems or some communities to be easier to invade. I don't know that much about that particular body of theory. I also know there's a certain amount of research about which types of organisms are better at being invasive than others. Basically, again, that's never been, like, my area of research. So if I were to do a lesson on that, I would have to do some serious reading to figure out what the basic concepts are.

Dongyu

Sure. Thank you. That's all I have .

Swathi

Got it. I guess I'll give you this opportunity, Laura, if there's anything else that you wanted to add just in relation to invasive species and what you as an educator, you've spoken a lot about the importance of learning about invasive species, especially repercussions that they have on the local community. If there's anything else that you wanted to add, I just wanted to give you the chance.

Eidietis

Yeah. I think the level of ignorance is pretty I mean, from my perspective as a biologist, when I walk into a system. Right. I'm always looking for the invasive and the native and any system I walk into, the invasive species have completely changed the system, and I know that. And I have that picture in my head, and I think a lot of my students who are coming from a more sort of general public standpoint these sort of things in terms of natural and unnatural and don't recognize that invasive species are kind of the intersection between that, right? Because they're natural but yet it's the human interaction with the environment that has caused a lot of these invasions to happen. Right. There's a lot of ignorance about the sort of level of impact of invasive. Unless you manage land, then you know it really well. But most of my students don't. That's one of the reasons I've chosen to focus a lot on as case studies because I've been a little concerned about the lack of knowledge about how much things change and how fast things can change also, right? So I guess that's what I would add to it.

Swathi

Absolutely. No, I appreciate it. I think that's everything from both of us that we had I wanted to thank you again for joining us for this call and taking time out of your busy Friday, but yeah. Thank you very much. Okay.

Eidietis

You're welcome. Good luck writing up your stuff. All right.

Swathi

Thank you so much.

Dongyu

Thank you.

Eidietis

You too. Bye bye.

Appendix D. Personas & Scenarios



Meredith Hudson

Background

Meredith is an ecology researcher studying invasive species. She uses databases, such as GLANSIS, to track non-indigenous species in the Great Lakes area. Given her years of experience, she usually knows what she is looking for.

"More commonly, I will type GLANSIS and the species I'm looking for in Google and let it take me directly to a fact sheet page on GLANSIS."

Personality	Motivations
• Efficiency • Careful • Introvert	• Credits **** • Readability *** • Convenience *****

Goals

- To quickly search for more information on an invasive species

Pain Points

- Takes multiple steps to finish a simple search
- Readability of information pages

 Ecology Researcher

 50 years old

 Ph.D in Biological Sciences

 Madison, WI

Scenario:

Dr. Hudson is doing her routine research about local invasive species. Since species invasion changes the ecological system very fast, she needs to monitor the situation about once a month to gather more accurate data for her research. GLANSIS is a good place for her routine data gathering since it has good credits. Every time she opens GLANSIS, she will perform searches for many different species, which makes the process of searching itself very long. GLANSIS provides advanced search function only, and it takes her a few steps to navigate to the searching page, which makes her searching process directly through GLANSIS searching not comfortable. Now she no longer goes to GLANSIS to perform her routine search any more, but she is using Google to navigate her directly to the species profile page in GLANSIS database.



Alex Bryant

Background

Alex is a high school ecology teacher. Along with teaching, he also works with other researchers and contributes to research studies on invasive species as well as plants in the Great Lakes area. Alex has not used GLANSIS to search for information but has several times contributed to the data base.

"I want to contribute my work to as many resources as possible. I see the need in streamlining contribution processes and making it easy."

Personality	Motivations
• Detail Oriented	• Credits ****
• Committed Worker	• Readability ***
• Extrover	• Convenience *****

Goals

- To contribute to GLANSIS's database

Pain Points

- Takes a lot of time and steps to make sure your work is contributed.
- When your work is not published on time and not linked correctly.

-  High school science teacher
-  47 years old
-  Ph.D in Ecology
-  Chicago, IL

Scenario:

Alex knows how important it is for invasive species researchers and management to get latest information about invasive species like rusty crayfish, so he goes outdoors to find out those species around Lake Michigan regularly and report them to GLANSIS through the contribute tool. Since the species invasion process changes very quickly, it is crucial for researchers and management to get up to date information as soon as possible. Alex does not do research or management himself, but he knows the importance of it, so he goes out and contributes observation reports twice a month. However, he finds that not all his reports are published or information has something not right. Also, there will always be a long wait after the report is submitted until the publish. He thinks GLANSIS might need to be more efficient in this process.



Sarah Johnston

Background

Sarah teaches intro level biology in college. Since it's an intro level course, she wants students to get interested in how biology is crucial to everyone's living world. Thus, species invasion can be a good real life example for her to show what is changing because of the biology problems in both ecological and social ways.

"The invasive problem is always there, but not everyone knows it. I think it's necessary to let people know we have the problem, not ignore it."

Personality	Motivations
• Expressive	• Credits ****
• Careful	• Readability *****
• Extrovert	• Intro Level Knowledge ****

Goals

- To notify as many people how critical the invasive species problem is

Pain Points

- It's hard to show people who knows not much a lot of quantitative information.
- I don't know much about social influence, so I have to check information before teaching my students every time.

 Intro Biology Lecturer

 38 years old

 Ph.D in Biology

 Lansing, MI

Scenario:

Sarah knows it's hard to get freshmen interested in biology or ecology, but she knows it's important to introduce them how important it is. The Invasive species problem is a very good example since there are many real life invasive species around the environment where students live, and the changes are rapid enough for students to notice what's different. She uses GLANSIS frequently, especially for school projects and to gather information. She has confidence to introduce the environmental changes caused by invasive species in the past 10 years since these are memorized deeply in her brain. However, her students now are asking questions about more recent invasions and social impact caused by the invasives. This is the time she realizes that she needs to gather more up to date information...

Appendix E. Affinity Wall

