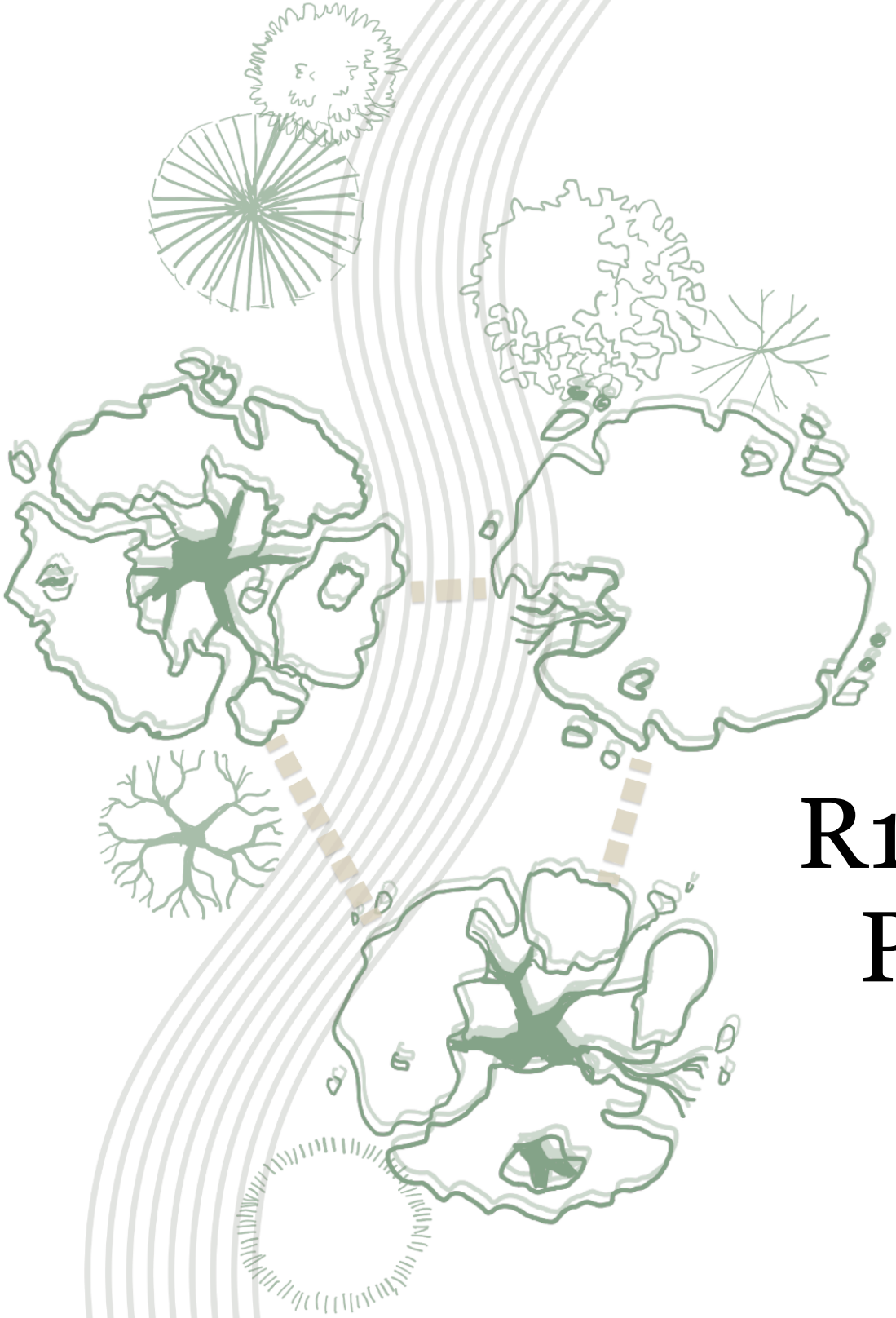

R1 Project Proposal

Georgia Aquarium
Treetop Interactions

PSYC 6023
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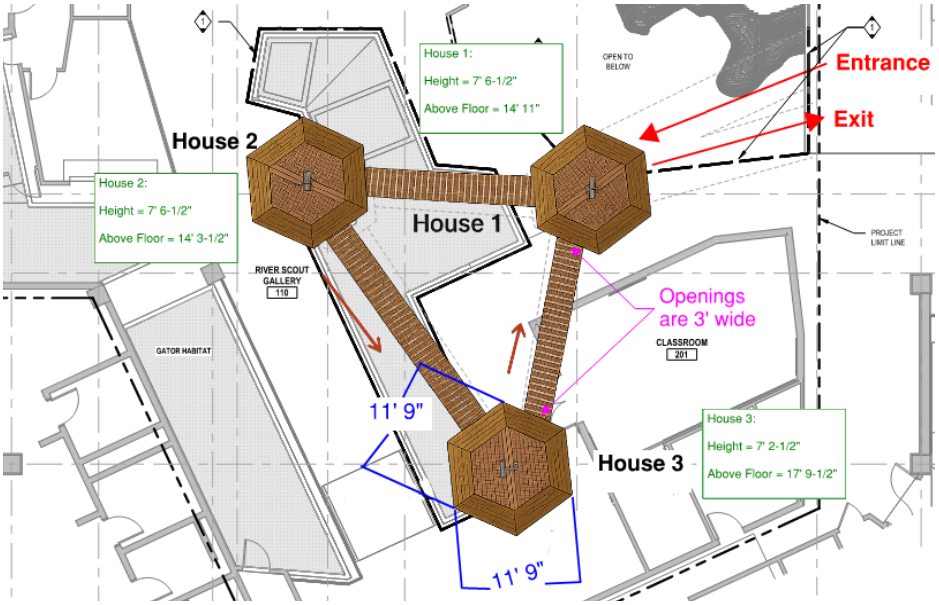
Background

Sketch of treehouses on panorama of its future location. These wooden structures will be around 9ft high in the air above the fresh water gallery, built around the pillars.

Overview

The Georgia Aquarium is the largest aquarium in the United States, with over 500 species and 11 million gallons of water. It is the only place in the United States where guests can see rescued whale sharks, members of the largest fish species in the world. Due to these conservation efforts, the aquarium now garners over 10,000 attendees in one weekend. The Georgia Aquarium strives to invest in both conservation and research to protect the future of aquatic life. They do so by providing multimodal education for all ages to inform guests about preserving and advocating for the thousands of species in the waters. They hope to inspire a new generation of scientists to pioneer research of lesser known species in aquatic biology.



Blueprint Sketch of the treehouse structures

Our team is tasked with the creation and introduction of several interactive technologies through the prospective children's treehouse-themed climbing area within the Peterson Preserve freshwater exhibit. This future climbing area and interactives will highlight the important relationship between the trees, freshwater systems, and animals. Our goal is to educate children about the conservation of the freshwater ecosystems through various interactives. We plan on centering our research around the dynamics that children and their parents have with the existing interactive technologies in the aquarium. They will visit each of the 11ft by 11ft treehouses in a sequential order (i.e. Treehouse 1 to Treehouse 2 to Treehouse 3) to avoid collisions and confusion among the staff and visitors. Through our work, we hope to partake in the advocacy for freshwater life.

The Freshwater Exhibit

The freshwater exhibit features two galleries: River Scout and Peterson Preserve (not yet implemented). These galleries are not just limited to fish; they also plan to feature arboreal animals. The exhibit focuses on North American river fish, American alligators, and Asian otters. It features one of the 50 albino alligators in the world at a close-up yet safe distance.

Bottom level of Georgia Aquarium's River Scout Exhibit

This is also one of the heavier themed exhibits of the aquarium. There are working waterfalls, miniature dams, decorations integrated with tanks, and a simulated river that flows above visitors. It offers the immersion of being in the native environment of the species without the dangers that come with them. The goal of this exhibit is to generate appreciation and awareness for freshwater environments. Drawing on this exhibit, we will investigate the importance of maintaining environmental immersion through a strong theme/visual identity.

Problem Statement

How can we integrate interactive technologies as a way to teach children about the importance of tree conservation and freshwater ecosystems? How can we do so in a calm, educational, and immersive way without overstimulating guests? What can we do to manage larger crowds and mitigate blockages along the treehouse route?

Significance of Addressing the Problem

Over the past few decades, wildlife conservation has been pushed to the headlines due to the rapid extinction of animals. Thanks to global efforts to preserve biodiversity, we have been able to save some animals from extinction, but there will always be cases of species loss. Freshwater ecosystems have been hit the hardest in the midst of a global biodiversity decline at a “rate three times faster than that of forests” due to destructive agricultural pollution, unpredictable climate change, and disruptive human developments (Sayer et al., 2025). If there is no change in our detrimental practices, these habitats and wildlife may be gone forever. Without these environments and animals, the larger ecosystem as a whole will be negatively affected. We would like our designs to acknowledge the magnitude of this issue and raise awareness.

The rate of decline in biodiversity of freshwater ecosystems does not have a similar level of awareness as other marine or terrestrial ecosystems. Due to immense pressures for more freshwater resources and general lack of awareness of these smaller ecosystems, as compared to massive oceans, “assessments for freshwater fishes and invertebrates [have] received comparatively little investment… including from the mainstream conservation community” (Sayer et al., 2025). Georgia Aquarium’s freshwater exhibit aims to be a voice of advocacy for the research and conservation efforts for these overlooked ecosystems.

This method has been proven to be quite successful in the past. When the Georgia Aquarium opened, little was known about the whale shark due to their rapid population decline. For many people, this was the first time that they could see a whale shark up close and in person. Before then, experts and enthusiasts had to travel across the world to be able to just see them, and now they have become the icon of the Georgia Aquarium. This surge of interest has turned into advocacy and support for the conservation efforts for the whale shark. Thus, within the 20 years of opening of the

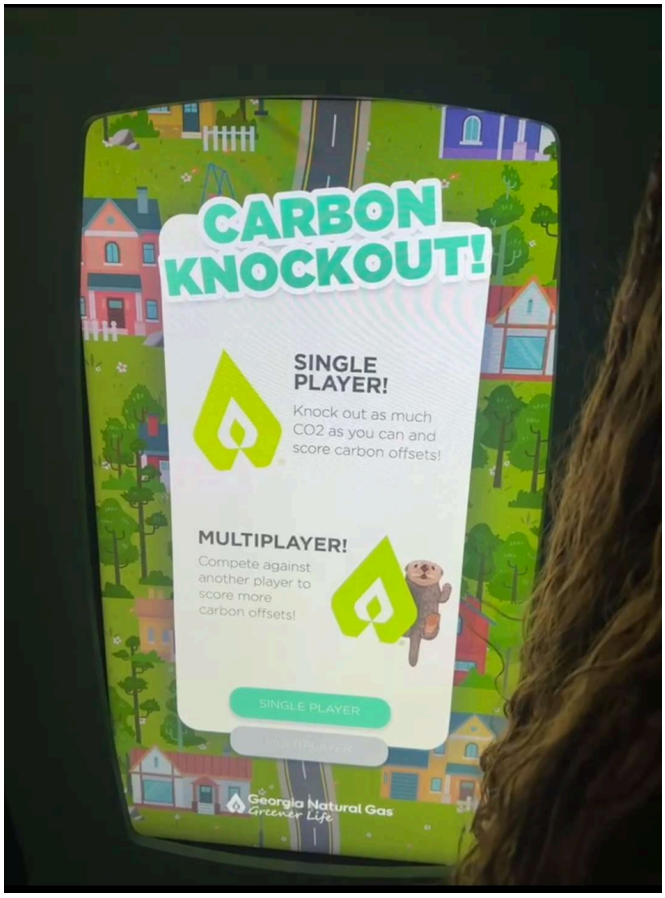
aquarium, major breakthroughs like the first complete shark genome and funding for conservation research are the direct result of greater audience outreach (Georgia Aquarium, 2025).

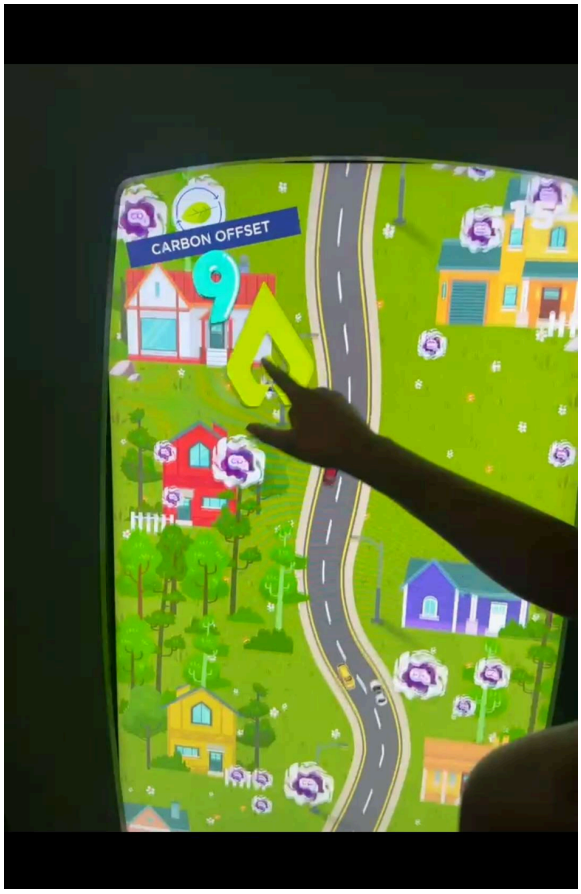
Our team hopes to replicate the success of the whale shark with freshwater species by capturing interest in these animals, inspiring a future generation of wildlife researchers and advocates. By adding more interactive features to the exhibit, we may be opening the doors to more care and funding for freshwater biodiversity, allowing more generations to experience what they have to offer.

Existing Interactives at the Aquarium

We want to learn from existing interactives and see how effective they are at engaging, entertaining, and educating children. Evaluating the effectiveness of these interactions can better inform us on how to design and develop future artifacts for our exhibit. This section will discuss some of our initial findings during our first walkthrough of the aquarium. Although our comments for this section are mostly speculative, as we did not directly interview any of the participants that we observed, our team found this initial exercise useful since it helped us focus more on the relationship between the artifacts and the user.

CO2 Clean Up Game

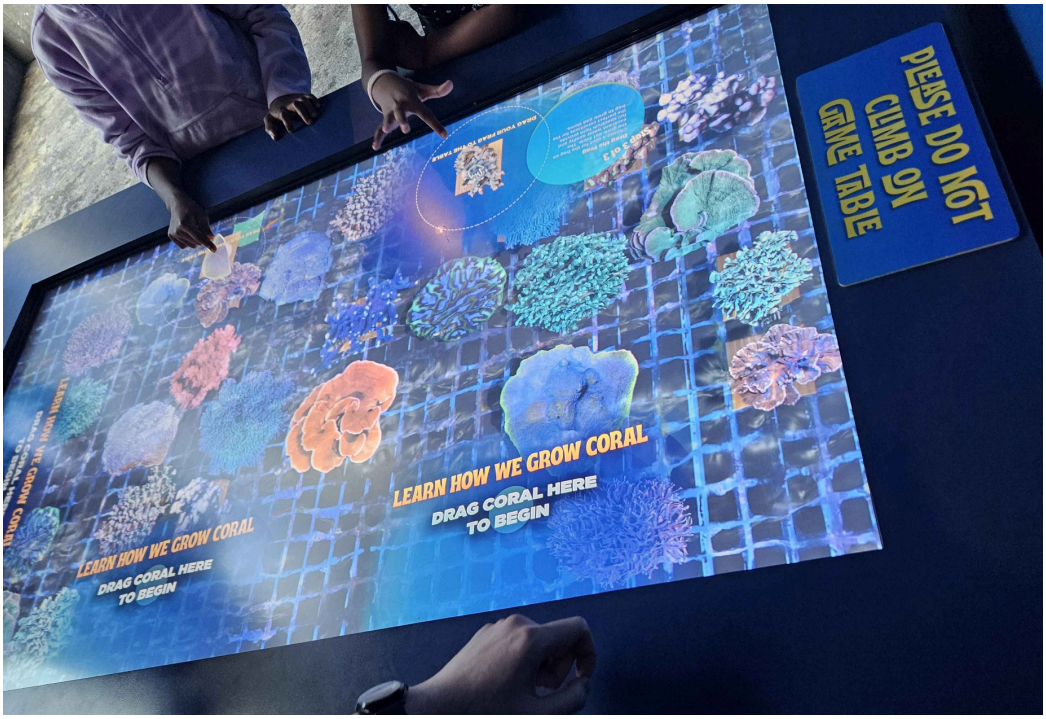




CO2 Interactive at Cold Water Exhibit in Georgia Aquarium

This is one of the first digital interactives we encountered on our initial visit to the aquarium. The user drags a finger across the screen to control a CO2 clearing symbol, highlighting how detrimental CO2 pollution can be to our world. However, it does not offer any real-world ways to reduce our CO2 pollutants, completely gamifying our atmospheric health. Even though it was a crowded day, we only saw one child interact with this artifact. It is possible that this is because the interaction itself lacks depth. The simple motions and gameplay may not be as dynamic as the other interactives in the aquarium. We aim to avoid this problem by creating experiences that prompt participants to think deeper about real-world issues.

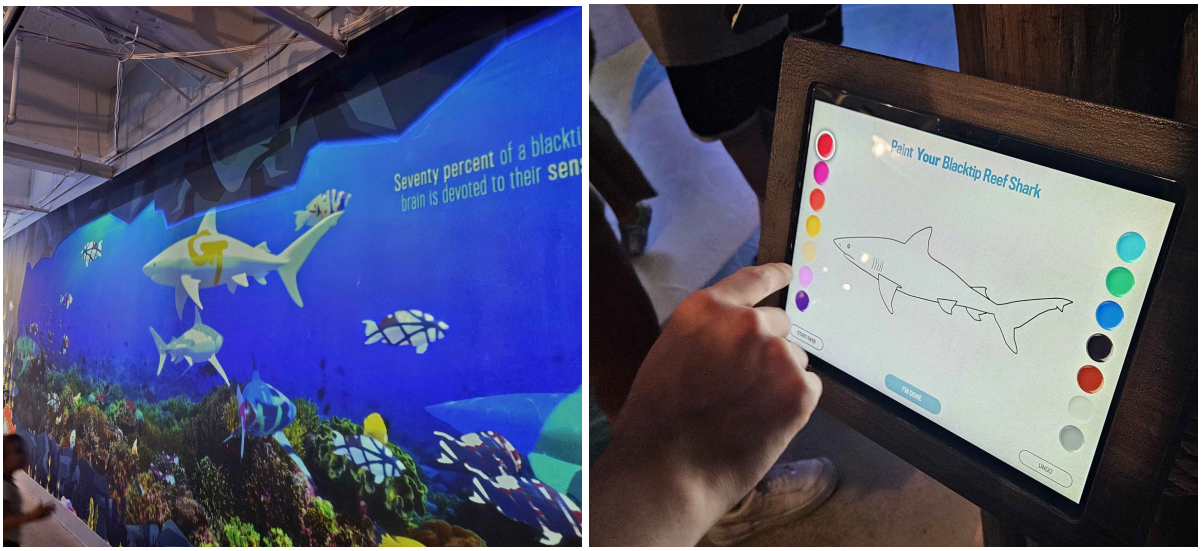
Coral Reef Planting Simulation



Coral Simulation at the Tropical Exhibit in Georgia Aquarium

This table top interaction takes a user through the steps of how scientists improve marine ecosystems by growing new coral. The digital experience allows for four users to interact with it at a time. However, we noticed that none of the visitors were interacting with the simulation, despite the room being full. It was only when our group surrounded the table that a parent and child duo also tried the simulation. The interactive is adjacent to a ceiling-high fish tank that displays various species of marine animals. Therefore, it is possible that the guests were more interested in watching the live fish than using the touch screen. Based on this observation, we want to design exhibits that provide similar levels of engagement and stimulation as watching live animals. We also noticed that a parent had to help their child start the simulation since the child was unable to understand the activity. This showed us that many children may not be able to grasp interactives that contain too much text/instructions. Therefore, we should create experiences that are intuitive and easy to grasp for children.

Fish Designing



Fish Design Interactive at Shark/Ray Pool Exhibit in Georgia Aquarium

This last activity took place near a shark touchpool where children can digitally paint on a 2D outline of a fish. This station was full of children. We attribute this popularity to its open and approachable layout. The numerous poles around the space had three tiltable screens that allowed multiple children to draw at the same time. The drawings are then projected on a large screen, giving children the motivation to move away from the screen and give others a turn. This ability to customize the fish also seemed to entice the children to use this interactive. Many of the fish had the child's name written on it. Some were colorful, while others were more minimal. Based on this observation, we will need to design interactives that accommodate a wide range of children's heights and provide opportunities for creative expression.

Target Users of the Study

We have identified our target users as children between the ages of 5-12. Though this age range was given to us by our aquarium sponsors, we acknowledge that this roughly coincides with the "school age" stage from Erik Erikson's eight stages of development (Cherry, 2024). This will help us gauge our users' cognitive and physical limits. Because this area of the exhibit can also fit adults, we are also expecting some adults to walk through this course to accompany their child. However, the design of the interactives will be catered towards the children. Our research method and design strategy will be built upon fulfilling the needs of our target users along with mitigating crowd issues for the ease of the supervising employee.

Environmental HCI for Children

In order to tackle this ongoing issue with care, it is necessary to invest in research and resources that will help children engage with freshwater ecosystems and develop connections with them. The effective technologies that connect children to nature can be categorized as *instructional*, *exploratory*, and *contributory* (Anggarendra & Brereton, 2016). The *instructional* technology encourages independent learning while being immersed in the environment that they are learning about. We can use *exploratory* technologies on various scales (i.e. applied throughout the entire treehouse area or within one treehouse) to encourage children to seek out new areas of the exhibit and information so that they can gain more knowledge of the freshwater ecosystem. Lastly, because of the heavy theme of conservation, we can simulate citizen science activities to give them a sense of *contribution* to advocating for at-risk ecosystems (Anggarendra & Brereton, 2016).

Behavior of Interest

We want to find a way for children and their parents to get the most out of these activities. We also want them to feel invested in freshwater life, turning their care into advocacy for these animals. In order to do so, we need to design interactive artifacts that introduce visitors to these animals and understand which artifacts are the most engaging. Here are some questions we believe can guide us in the right direction:

- Which types of interactives are children most interested in, and how long on average do they spend on these artifacts?
- Are these interactives achieving the goal that they are intended to (i.e. educating the children on aquatic life)?
- Are parents helping children interact with the existing technology at the aquarium?
- What kind of relationship/power dynamic does this interaction evoke (apprentice-master, equal partners)?

Stakeholders

Employees

- Employees stationed at the freshwater exhibit will have to oversee the area to make sure that there are no visitors blocking entrances.
- Employees also monitor inappropriate behavior that would cause danger to the wildlife or others.
- Employees are in charge of maintaining and cleaning the area/interactives. If something breaks, they will also be responsible for repairs.

Smurfit Westrock

- Smurfit Westrock is the sponsor of the new treehouse exhibit. They will provide the materials and services that will bring the project to life. In return, they may be expecting some advertisements and company logos plastered around and inside the treetop climbing area.
- If the interactive components are poorly designed, this may reflect poorly on the sponsor, thus causing them to pull out of the project.

Aquarium

- The Georgia Aquarium wants to encourage visitors to advocate for aquatic life and the ecosystems they belong in. We need to create artifacts that not only entertain the visitors but also educate them about the threats to their ecosystems.
- If the interactive components are poorly designed, this may reflect poorly on the Georgia Aquarium, making them rethink about partnering with Georgia Tech

Aquarium visitors

- Aquarium visitors provide funding for the exhibits through ticket and merchandise sales. A new interactive exhibit in the aquarium could entice new visitors and maintain the interest of regulars.
- Many visitors bring their kids to provide them an educational and visual experience. Having new interactive systems implemented can aid the child's understanding of freshwater biology and the motivation behind conservation campaigns.

User Groups

Our user groups fall into three categories: children, parents, and workers.

- *Children* include persons typically between the ages of 5 and 12, who will play and interact with the structure.
- *Parents* include persons who are parents of children interacting with the structure. Although they may not interact directly with the exhibit, parents are important to the conversation as many will stay back and monitor their children from afar.
- *Workers* include people working in the exhibit, people that oversee other interactives/attractions, and adults who work in the creation and maintenance of interactives at the aquarium.

Potential Goals and Opportunities

Overview

Our main goal is not just to create a physical environment for the aquarium, but to also produce an engaging, educational experience for visiting children. We aim to create three spaces with underlying themes of instruction, exploration, and contribution as the children gain more knowledge on canopies and freshwater systems (Anggarendra & Brereton, 2016). In these spaces, we want to facilitate a science-based curriculum, garner more interest in the outdoors, and encourage children to give back to their surrounding ecosystems.

Research Goals

Besides the overarching goals, we have additional objectives we would like to address:

- Explore ways to make 3D spaces educational and appropriate for children ages 5-12
- Inspire children to become more interested in canopies and freshwater systems
- Teach children the importance of these species and how they can contribute to their local ecosystems
- Carry out observations of employees and visitors to gain a deeper understanding of the average crowd flow and existing pain points
- Conduct interviews with aquarium staff, technical teams, and visitors to identify any present challenges with other exhibits
- Conduct comparative analyses with other child-related facilities (e.g. museums, amusement parks, etc.) to learn more about creating an engaging environment for children
- Collaborate with the aquarium to create an impactful story about the importance of various forest and freshwater species
- Prototype three interactive spaces and host focus groups to evaluate opportunities for improvement

Research Questions

Some research questions we would like to answer are:

- What is currently being done to keep our target audience engaged while also accounting for large crowds?
- Are there existing exhibits that provide an educational impact for visitors without overwhelming visitors with information?
- What methods have been used to assuage parents and include them in the design process?

- What kinds of exhibits do children like to interact with the most (ex: digital vs physical; visual vs tactile)?
- What artifacts are the most effective for leaving kids with a lasting appreciation of freshwater and canopy ecosystems?
- How are smaller spaces optimized for children's engagement?

Expected Methods

Stage 1: Exploration

Observations

To deepen our insights and learn more about how children learn and interact with educational spaces, we will conduct weekly observations at the aquarium. Observations allow us to systematically watch and record behaviors and interactions of aquarium visitors in real time without interfering. During these observations, we will primarily focus on children and also take notes of how other guests interact with the various interactives. Most of our observations will be done in interactive areas of the aquarium and other spaces where children engage, such as playgrounds and museums. We will immerse ourselves in these spaces and jot down our observations and interpretations on how everyday people interact in these contexts. This method allows us to see authentic behaviors as they unfold rather than relying on children's self-reports, since they may struggle to articulate their thoughts clearly. One limitation of this method is that it may not fully capture participants' internal motivations or reasoning behind their actions. However, our other exploration methods will be able to counteract this. We will use these insights to inform our design decisions and develop an interactive experience that is both educational and narrative.

User Interviews

We will also conduct interviews with the identified user groups to better understand what they like and dislike about the existing exhibits. This method provides access to insights that cannot always be observed directly, such as motivations, preferences, and challenges. While interviews can be prone to bias, we will minimize this risk by carefully designing our questions to avoid leading responses. Interviews will also help us understand how to design an exhibit that enhances visitor experiences without adding significant workload for aquarium employees. All data will be compiled in a designated Box folder, with no personally identifiable information collected. One challenge to note is that this project is not yet public, and even some staff members are unaware of it. Interview discussions will focus on how children use the aquarium spaces, along with any additional insights shared by workers and parents.

Surveys

Additionally, we will conduct asynchronous surveys to allow user groups to share their aquarium experiences at their own convenience. Surveys provide an efficient way to gather feedback while we carry out other methods. For example, survey links may be shared through QR codes in staff breakrooms, giving employees the flexibility to respond when they have time. We also plan to place surveys throughout the aquarium,

where guests can quickly share their thoughts and experiences. These surveys will help us understand what children prefer to learn and interact with, as well as the common pain points aquarium workers have when dealing with children and other guests. We will host the surveys on Qualtrics, which is more secure than platforms like Google Forms and carries Georgia Tech branding, making it appear more legitimate to participants. No personally identifiable information will be collected. We recognized that asynchronous surveys lack the benefits of asking follow up questions, but we will make sure that our other exploration methods are robust enough to identify the gaps.

Literature Review

At this stage, we will also conduct literature reviews to ground our work in existing research. This will help us understand how children engage with educational spaces, as well as how to build and design museum scale exhibitions and interactions. A literature review involves systematically examining scholarly articles and case studies to identify relevant theories and our gaps in knowledge. This method allows us to build on established findings rather than starting from scratch, ensuring our design decisions are supported by evidence. Additionally, existing literature is widely accessible and inexpensive, allowing us to efficiently gather insights. We will primarily be using Notion to track our references and store all our notes.

Stage 2: Data Analysis & Synthesis

Comparative Analysis

Comparative analysis involves the identification of similarities and differences between entities. In order to carry this out, we will compile data from our visits to different museums, science centers, and play areas that are aimed at engaging children.

We are using comparative analysis to learn how these organizations are curating impactful experiences for a younger audience. Additionally, it can teach us new ways to design for children of varying ages, cultural backgrounds, and abilities. These analyses will allow us to clearly understand what these organizations are doing well, and what they may need to improve on in terms of engaging children. By performing multiple comparative analyses over time, we will be able to learn which kinds of activities children truly enjoy, as well as the exhibits they do not resonate with. Although performing comparative analyses can be timely, prioritizing visits to the most relevant spaces will yield useful results. Moreover, this kind of analysis will provide us with concrete ideas for our design stage. After observing the qualities of each space, we will compare and contrast them on FigJam to find the most prevalent patterns that we can use for our ideation process.

Affinity Mapping

Affinity mapping is another analysis method that allows us to sort the notes from our exploration stage into broader categories/themes. We specifically selected this method because it will encourage us to review all of our collected data as a team, which is especially important if we gather any data separately. Additionally, it will allow us to clearly define any user needs that were outlined in our interviews, observations, and survey results. By compiling different categories of user behaviors and needs, we will have a clearer list of requirements that we can address during our design phases. Similarly to comparative analyses, affinity mapping can be time consuming and potentially lead to some biased categorizations. However, strategically referencing the raw data we collected will ensure we remain on track. Due to the amount of data we will collect, we plan to use FigJam to sort through our notes more efficiently.

Stage 3: Design and Prototyping

Building the Narrative

One of the recurring themes of the project is the idea of a narrative that binds the experience together. Therefore, in order to construct this narrative, our team will work hard on familiarizing ourselves with freshwater canopy ecosystems and how children learn so that we can refine the core message of this exhibit. Additionally, this project concerns three treehouses, which would make the perfect structure for a narrative. The three treehouses could map into the beginning, middle, and end, leaving the pacing for us to decide.

Storyboarding

This design method is crucial for providing the basis for the rest of the prototyping stage. For this method, we will generate sketches to depict how a user would navigate through the treehouses and how they will use the interactables. These sequential illustrations will inform our understanding about our users' experiences based on the data we collected in earlier stages. From this, we hope to understand more about their potential pain points and challenges so that we can avoid those when we start the prototype. We will complete our first draft of the storyboard on the white board in person so that we can make changes quickly together. The final version will be created digitally on Procreate, a digital drawing app that most group members have, so that it will take on a more refined appearance.

Although storyboarding is associated with rigid design, we will make sure that we do not focus too long on each storyboard so that there is not much attachment to any certain area. Despite this disadvantage, there are many advantages that storyboarding brings to this project. Its ability to foster empathy for users and identify issues early on will help us find ways to optimize the rest of our design flow.

Journey Mapping

Additionally, a design methodology that complements the storyboard is journey mapping, a UX tool that visualizes the user's process to achieving their goal. These will help us identify gaps within the guest experience so that we can determine where the pain points are and how we can resolve them. We will base these maps on our observations and interviews with the various attendees and workers at the aquarium. These users could be a child playing in a treehouse, a parent watching below, or a worker managing the pathways. We will combine journey mapping with our storyboard, so that we can envision how users will think, feel, and react each step of the way. This is a necessary step to take at this stage since we have to fully embody the target users to be able to design for them. To do so, we can first create drafts together on a whiteboard with sticky notes, which allow for rapid iterations and easy collaboration. Then, we will transfer these images and findings to Figma for a polished display to present to others.

Journey maps have a tendency to oversimplify a user's experience. However, by integrating ourselves more with the users, we can empathize with their issues better, avoiding too much oversimplification of a user's journey. We can also compare this map to some real-time visitors to ensure accuracy and representation. Journey maps also offer focus on the emotions, rather than actions, which is crucial at this stage.

Co-design Exercises

Co-designing is a process in which primary users actively participate in the creation of a product. We plan on creating a co-design session where children will be able to decorate and design their ideal treehouses. This will be done using traditional materials like markers, crayons and paper, but we hope to conduct a similar session that uses legos or other 3D mediums. These tools offer a tactile and creative means for children to express their ideas. We hope to see common features in their artwork to understand what is appealing to children. Afterwards, we will use this information to inform how we might design and decorate the interior of the treehouse exhibits.

Co-designed solutions are inherently user-centered because the process of making them is user-driven. Therefore, they can bring a perspective that designers may overlook. The main drawbacks are that co-designing could be time-intensive and require extra expenses. In this case, the benefit of co-designing can outweigh its drawbacks since they would offer us a perspective from children that we might not consider as adults. We are planning on running these sessions in the aquarium cafe or other similar spaces. These sessions will be done in small cohorts of 2-6 participants composed of either children visiting the aquarium or children of fellow Georgia Tech students and staff. We currently do not have any compensation, so we will emphasize

making the sessions fun and engaging, rewarding children with creative exercises and the joy of making meaningful contributions.

Walkthrough Prototypes

To envision the way users would move through this space, we will create a low-fidelity 3D prototype using the approximate measurements given to us. This could be done in a field, using chalk, tape, cardboard, etc., so that the user can feel the immersion of being in the confined space with the interactables without having to build the tangible product itself. Not only could we mock up the space physically, but we could also mock up the space digitally with a game engine, such as Unity, using a first-person perspective to navigate it.

The majority of these tools are inexpensive or can be rented for temporary testing and use. Another benefit of walkthrough prototyping is that it helps us understand our users' needs through empathy. We put ourselves in our users' shoes, so we could better understand their expectations and pain points. This is a good way to see how users will potentially react in the space so that we can quickly iterate and make changes to improve the environment.

Functional Prototypes

For interactives in the treehouses, we will create minimally viable prototypes. Prototypes could be created with interactive libraries such as processing with Python or Java, and microcontrollers, such as Arduinos or Raspberry Pi. Our team has members that have experience with these programs and microcontrollers so that we can spend more time on the design of the artifact, rather than learning how to use them. Also, these minicontrollers can be rented through Georgia Tech from the HIVE. If possible, these prototypes would be tested with our user groups to see if there are any emerging issues with our designs.

At this stage, we will have to gauge to see if our prototypes are viable for our user groups. To prepare for user validation, we must create an artifact for the user to test, but we also have to balance the level of polish since if there are any problems, we will have to rapidly iterate and change the prototype. Functional prototyping will allow us to do so without having to scrap refined construction.

Stage 4: User Testing and User Feedback

Dot Voting

Dot voting is a form of receiving participant feedback in which users receive a limited number of stickers (dots). With several voting options displayed, users vote by placing a dot next to their preferred voting options. Afterwards, the options with the most dots

next them are deemed the most prioritized by users. We will print out our designs and ideas and display them in the aquarium. When children visit, we will portion out several dot stickers so that they can cast their votes. We plan to use dot voting as a means of receiving feedback from children to understand and gauge which designs and ideas children prioritize. We would then use this feedback to guide our next design decisions.

Dot voting offers several advantages. It is simple, fast, tactile, and visual. Therefore, we chose this method because it allows children to easily understand and participate in this voting method. However, one of the disadvantages of dot voting is that it is highly visible, which may encourage children to vote for options that seem more popular rather than their honest opinions. In this case, the ease of dot voting outweighs its cons, and we hope to gain honest and useful feedback from the children.

Heuristic Testing

Heuristic testing is the evaluation of a design by experts to identify key usability issues based on a set of usability guidelines (i.e. heuristics). We will show our designs to a panel of expert evaluators. Our shepherds will both participate in this panel and source additional members. As a result, we will understand our users' needs through the expertise of the panel. After evaluation, we will analyze their feedback in order to improve our design decisions.

Advantages of this method include its speed and cost-effectiveness. Compared to a resource-intensive usability study, heuristic testing offers low-cost, expert feedback quickly. However, the effectiveness of this method depends on the knowledge and diversity of our evaluators. Receiving subjective feedback from a small group of individuals can weaken the quality of our insights via sampling bias. However, as we are operating on a limited budget and a short period of time, the advantages of this method outweighs its limitations. We anticipate receiving thoughtful critiques that will uncover key usability challenges in our designs.

Expected Resources

How to Build an Exhibit 101

For this project, it is critical for us to gain a strong foundation in creating and designing exhibits and physical spaces. Here is our initial list of resources about creating engaging and accessible exhibits:

- A Guide to Exhibit Development
- Smithsonian Guidelines for accessible exhibition design
- Museum Accessibility Toolkit
- Inclusive Digital Interactives Best Practices + Research

We will also review existing work and research on designing educational and environmental experiences for children. We found a few sources on which technologies are effective at engaging children though environmental HCI and a participatory design framework for developing interactive exhibits for children (Anggarendra & Brereton, 2016; Axelsen et al., 2014).

This research will be invaluable to informing how to curate an engaging learning environment that entertains children while telling a memorable story about tree conservation and its connection to preserving freshwater ecosystems.

Aquarium Teams

A great resource will be our Shepherds: Hart Gates and Kelsey Toth. Hart Gates is the Project Manager of Exhibits and Capital Projects. Hart will be our main resource when it comes to the physical construction of the space and general logistics of the project, including its technical and physical limitations. Kelsey Toth, the Brand Manager, is very knowledgeable about the aquarium's educational content, communications and overall branding. She will provide us with information about different plants and animals in the River Scout exhibit. This will help inform which key lessons and educational experiences should be prioritized. She also reviews any of our communication with employees and visitors.

We will interview and survey the aquarium workers who work closely with children and interactive exhibits, such as the touch pools and penguin tunnels. This helps us get a better idea of how to manage crowd flow as well as the common successes and challenges of aquarium interactives in the past.

We will also talk to the audio-visual team since they can tell us more about the technical possibilities and limitations of the aquarium to apply to our exhibit.

Specifically, we would like to know what types of interactives and activities are susceptible to breaking down and which ones are easy to maintain.

Project Management Tools

Notion will be a primary tool for managing this project. The Notion board will contain meeting notes, observations summaries, weekly recaps, project and assignment tasks, references, and other project management related data that we might find useful in the future. We will also use a Box folder to store our data from our observations, interviews, survey questions, or any other data that we see fit.

Design Tools

We will primarily be using Figma, Procreate and the Adobe suite to create the visual aspects of this project. We will be using FigJam for affinity mapping, brainstorming and any other activities we see fit. Additionally, we will use art materials like markers, paper, and legos for our co-design sessions.

Prototyping Tools

We will be using mock-up materials like chalk, tape, and cardboard to create our physical and lo-fi prototypes. Additionally, we will be using Unity, Processing, Arduino, Raspberry Pi, and open source software to build our digital and functional prototypes.

Survey Tools

We will be using Qualtrics, which is more secure than platforms like Google Forms and carries Georgia Tech branding, making it appear more legitimate to participants.

Other Spaces for Observations

The nature of this project requires us to study and observe how children engage in various learning spaces. Here is a growing list of other spaces similar to the aquarium that we plan to visit and observe:

- Fernbank Museum of Natural History
- Children's playgrounds throughout Atlanta
- The Children's Museum
- Zoo Atlanta

Weekly Breakdown

Mondays | Team Meeting + TA Time

6 p.m. @ HCI Lounge

Beginning time will be used to update Dan and ask questions. 3 hours.

Wednesdays | Studio + Team work time

5:10 p.m. @ HCI Lounge

Work on deliverables and brainstorm ideas or on our individual project assignments and tasks. 2 hours.

Thursdays | Shepherd Meeting

9:30 a.m. @ Zoom

Weekly updates and feedback sessions with Hart and Kelsey. 30 min.

Fridays | Weekly Recap + Bonding sesh

4 p.m. @ HCI Lounge

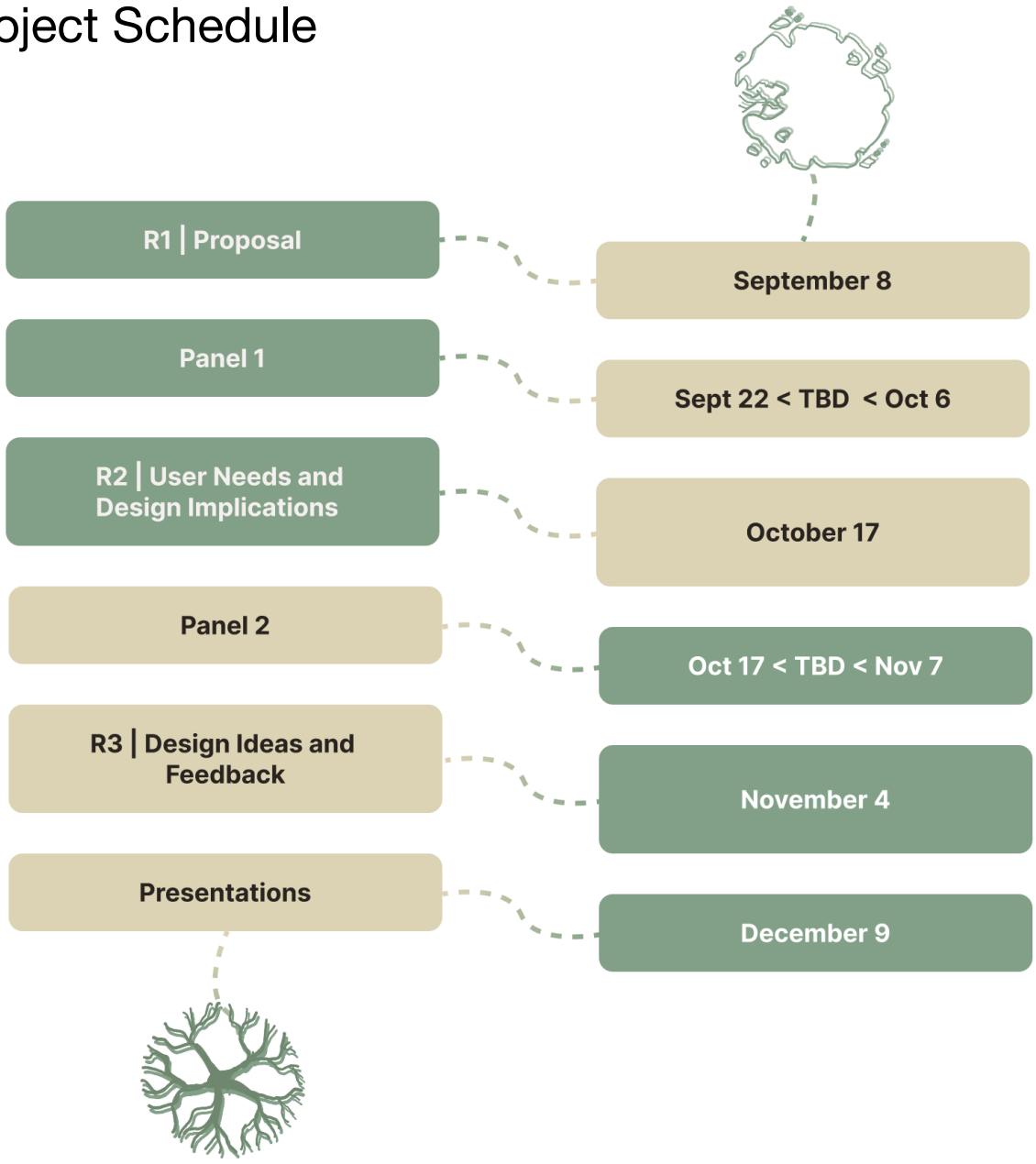
Weekly Recap (~30 min) + We listen and we don't judge sesh, then bonding time :)

Weekends | Aquarium Visits

Time Varies @ Georgia Aquarium

Aquarium Visits for observations, feedback, testing etc. Might also visit other locations of interests. 2-3 hours minimum.

Project Schedule



Lessons Learned

Two of our biggest challenges so far are that none of us have experience with children based research and none of us have ever made interactive artifacts to this scale. We have backgrounds in research, interface design, art, and computing, but prototyping tangible artifacts that are centered around children is quite a new area for us.

Though it is tempting to be intimidated by this uncertainty, we see this as a great opportunity for us to grow and learn. We will heavily rely on our observation methods and comparative analysis to inform how we will design for this space. We will also study various existing museum guides that focus on how to build exhibits and make accessible and engaging experiences for children.

One thing that surprised us is the amount of freedom and leeway we have with this project. Although there are loose guidelines set by our sponsors and the limitations of the small treehouse space, we have the autonomy to choose the types of interactives present inside the treehouses. Even though we are allowed to have this space for our creativity, this does not mean that we can neglect the users' needs and desires. On the contrary, this allows us to focus our designs with the needs of the users in mind, rather than having the aquarium or the exhibits sponsor directing our designs.

We are also learning more about balancing our individual strengths and team dynamics. Each of us brings a specific skillset that will aid greatly in this project, but we are consistently mindful of not putting people in boxes and assigning tasks that will positively challenge us.

One thing we also are learning is how to be on the same page. Halfway through our process, we realized that we all had different visions for how this project might turn out. For example, some members had slightly different ideas of what the methods and final deliverables of this project would be. To rectify this, each member of our team shared their vision of the project's process from start to finish, and what they wanted to work on. Not only did this discussion yield a collective project roadmap, but it also revealed which areas each group member wanted to lead.

References

Anggarendra, R., & Brereton, M. (2016). Engaging children with nature through environmental HCI. Proceedings of the 28th Australian Conference on Computer-Human Interaction - OzCHI ’16, 310–315. https://doi.org/10.1145/3010915.3010981

Axelsen, L. V., Mygind, L., & Bentsen, P. (2014). Designing with Children: A Participatory Design Framework for Developing Interactive Exhibitions. The International Journal of the Inclusive Museum, 7(1), 1–16. https://doi.org/10.18848/1835-2014/cgp/v07i01/44473

Cherry, K. (2024, May 2). Understanding Erikson’s stages of psychosocial development. Verywell Mind. https://www.verywellmind.com/erik-eriksons-stages-of-psychosocial-development-2795740

For Museum Professionals. (n.d.). Access.si.edu. https://access.si.edu/museum-professionals

Georgia Aquarium. (2025, August 7). *20 years of wonder: Georgia Aquarium’s global impact on whale shark conservation and Discovery*. Georgia Aquarium. https://www.georgiaaquarium.org/resource-center/stories/20-years-of-wonder-georgia-aquariums-impact-on-whale-sharks

Sayer, C. A., Fernando, E., Jimenez, R. R., Macfarlane, N. B. W., Rapacciuolo, G., Böhm, M., Brooks, T. M., Contreras-MacBeath, T., Cox, N. A., Harrison, I., Hoffmann, M., Jenkins, R., Smith, K. G., Vié, J.-C., Abbott, J. C., Allen, D. J., Allen, G. R., Barrios, V., Boudot, J.-P., … Darwall, W. R. T. (2025, January 8). One-quarter of freshwater fauna threatened with extinction. Nature News. https://www.nature.com/articles/s41586-024-08375-z#:~:text=Prevalent%20threats%20include%20pollution%2C%20dams,with%20overharvesting%20also%20driving%20extinctions.