

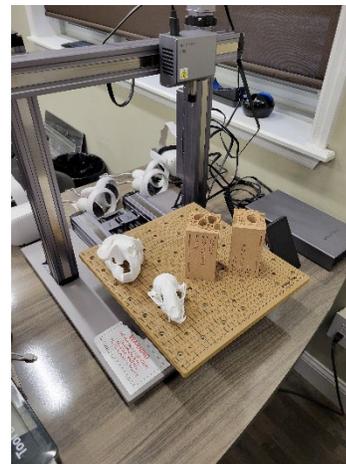
Handshake Partnership Program Final Project Close-Out Report

1. Fiscal Year Selected as Winning Project: 2021
2. Name of Corps Project/Lake: Carters Lake
3. District / Division of Corps Project/Lake: Mobile District / South Atlantic Division
4. Handshake Project Name: **Modernizing interpretation through immersive, interactive, and useful technology.**
5. Amount of Handshake Funds remaining: \$0.00
6. What has been accomplished? Please provide photographs; before, during, and after!:

The funding provided by the handshake allowed us to increase the technological footprint of interpretation at Carters Lake. Interpretative design designates displays which the visitor can interact with, which interact back with the visitor as highly effective. However, we cannot overlook general information and basic interactions. Through the partnership funding we were able to purchase a slew of technology which will allow for creating a more immersive and interactive learning experience. Among these technologies for our Nature Center rehabilitation are the PC Integrated touchscreen display, the HoloFil Holographic displays, and Meta Quest Virtual Reality (VR) Headsets. Technologies acquired for general interpretation included the Unistellar eVscope Equinox Computerized telescope, for Carters Lake's growing astronomy program and a Snapmaker 2.0 3-in-1 3D printer, CNC, and Laser Engraver. Lastly, the funding provided a means to afford additional interpretive signage and materials to support the new and engaging format of the Carters Lake interpretive program, chief among these being the materials for building entirely new kiosks for the Nature Center and interpretive and location marker signs of the newly designated Carters Lake Astronomy Field. The partnership was spurred by engaging Kennesaw State University (KSU), College of Computer Engineering and Design to see if they would work with us to create customized learning experiences for various electronic formats. These were further targeted to technologies once we were able to acquire the technologies and test them. Through this partnership the Corps will gain access, for any project, to the custom created applications for use in their Visitor or Nature Centers.



New Kiosks built in-house



Snapmaker 2.0 3-in-1 3D printer

To further explain the Nature Center interpretive technology let us breakdown each technology and detail the software created or being created for each. The Meta Quest VR headsets were the first iteration of our interpretive technology interest. Initially the project purchased an Oculus GO out of pocket to begin work with KSU. This headset was fairly limited

in both its processing power and firmware architecture. Enter the Oculus (now Meta) Quest headsets. These allowed for a more robust development environment. After working through many semesters over the last two years, we currently have two finished educational VR experiences. The first is called Food Chain Adventure and the second is called Museum of the Living Past. Food Chain Adventure allows the visitor to take a first-person place in the food chain to understand the flow and importance of the food chain while gamifying the learning experience. Museum of the Living Past allows the visitor to enter a museum environment to learn about Native American artifacts, but with an added twist. Upon picking up the objects, the visitor is transported to a new location and is required to use the tool in a mini game to return to the museum. This semester will see the beginning of development on a new natural resources game focused on pollinators, more specifically the Honeybee. This will be developed over the next three semesters. All of these experiences were created by student teams as part of their Computer Game Design course.

The Holofil Holographic displays are a brand of a fairly abundant technology. The company however is very small, and their prices are much lower than the larger branded displays on the market, while performing in the same manner. However, these displays were advertised and function in a way so as to allow the visitor to interact with the display using a game controller. In these displays, the image is projected downward from a mounted tablet onto a specially coated piece of angled glass. This gives the appearance of a floating holographic image. This past semester saw the completion of the first experience for the holographic displays. The application is an educational experience educating on wildfires, their role, their hazards, and the role of prescribed burning in prevention. Throughout the learning cues are three separate mini-games which gamify the learning process yet again. This particular project was a Capstone project for graduating students and provided a valuable source of project development for the students as well as an invaluable benefit to the Corps. This coming semester, if chosen by a Capstone team, will see the development of an educational experience on litter and its impacts on the environment.



Holofil Holographic Display

The PC Integrated Touch Display is a commercial ELO touch display that would commonly be used for larger more robust touch panel uses, such as advertising and interactive ordering stations. However, at its heart is a simple Windows PC allowing for easy design of PC software for learning experiences. This flat panel will be mounted on the end cap of an interpretive kiosk and provide the tactile touch experience that so many visitors use on their phones every day. The most recent semester saw the design of an interactive game to educate on the management of water resources. In this experience the user must balance outflow, power

regulation, lake, and river levels. It is simple to manage but provides an idea of the factors which must be balanced. It provides educational pop-ups through the game experience. Again, this project was created by a Capstone team in a single semester. The coming semester, if chosen by a Capstone team, will see the development of a water safety educational game experience.

As stated, we purchased several technologies which would allow for assistance with general interpretation. Each of these technologies and their use will be explained. The first of these technologies was the Unistellar eVscope Equinox. As stated earlier, Carters Lake has a growing astronomy interpretation footprint as part of our goals to educate about natural resources. The project already had a larger telescope purchased out of pocket, but it is large, difficult to move, and not always particularly accurate. The award allowed us the means to purchase the eVscope which is a fully automated imaging telescope. This features of this telescope lend to a very robust design for group observation and interpretive purposes. The telescope, once powered on, will fully and automatically align itself with the night sky. Within approximately 5 minutes, the operator can have it accurately pointing at a night sky object. This telescope, unlike traditional scopes, uses a camera as part of its mirror layout. This means there is not eyepiece, everything is captured and displayed in true color. This combines with the ability for up to 10 visitors to connect via an internal wifi channel. The visitors can then view the session as it is occurring via the Unistellar app, and save images to their phone. Through this technology, instead of 2 – 3 targets, the operator is able to take the visitors on a tour of many targets in a tour type fashion of the night sky.

Unistellar eVscope Equinox
in use at astronomy event.



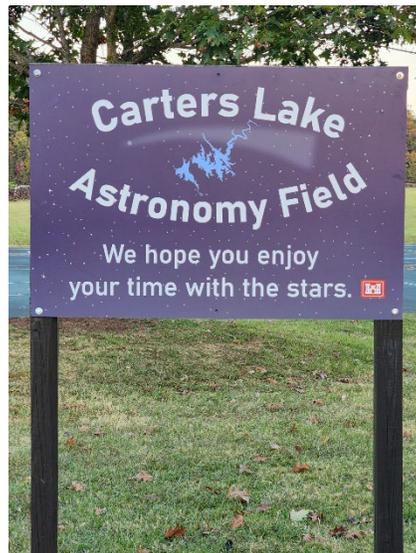
The second of the general technologies which we were able to purchase with the award was the Snapmaker 2.0 3-in-1 3D printer, CNC, and Laser cutter/engraver. This unique device has turned the 3D printing game on its head by providing an architecture to create 3D prints, carve using CNC, and cut or engrave using laser, all in the same machine. The machine accomplishes this by using modular heads and beds for the various functions which can be easily changed within a few minutes. There are an abundance of free 3D models created for and/or aligned with educational purposes. We have used the machine to create 3D prints of animal skulls to allow for visitor handling without the risk to real or pricey reproductions. We were able to locate scaled up models of the vascular system of trees which could be 3D printed to allow the visitor to handle and view a model of vascular tissue of trees. Lastly, we designed, and 3D printed the necessary components for an interactive interpretive display and plan to use it for that same purpose in the future on additional displays. The CNC proved invaluable in carving out two-tone acrylic sheeting to create professional informational plaques for display items in the Nature Center.

As discussed previously, we also used funding to purchase materials and items to support the new learning environments created by the purchase of this technology. The items we purchased included materials for building new kiosks for the Nature Center and interpretive signage for the Carters Lake Astronomy Field. It also included the purchase of a replacement projector for the Augmented Reality (AR) Sand Table located in the Nature Center. These additions will be explained. The Nature Center has a circular layout and the original layout included a large barrel kiosk on the central column and three large semi-circular kiosks surrounding the column. These kiosks had an enormous footprint and we knew they would not allow the addition of new kiosks and features. They took up approximately 48 sq ft of space, while the new kiosks take up only 16 sq ft each. The new kiosks were built in house by very skilled volunteer staff using MDF and laminate purchased with the award funds. The old informational boards from the original kiosks were cut out and used to mount onto the face of the new kiosks. In this way, we were able to take the displays vertically to provide greater openness to the horizontal layout of the room. This meant greater room for placement of the new technology displays mentioned above.

The Carters Lake astronomy interpretation program and the resulting Carters Lake Astronomy Field have been several years in the making. The passion of Park Ranger George McBroom for Astronomy ultimately led to wanting to hold interpretive programs on site and promote the use of Carters Lake as a dark location for viewing. The interpretive signs in the park are located at the southern end of the astronomy field allowing for a wide view of the sky. There are five interpretive panels which educated on different introductory aspects of astronomy. Additionally, there is an interactive panel laid out as a planisphere which allows the turning of the wheel and the ability to learn about what a planisphere is and how to use it. This was only first step in making this the official astronomy field. Funding finally provided the ability to purchase signage that designates the field officially and provided use rules for the public.



Interpretive signage in astronomy field.



Astronomy Field designation sign

	Total
Handshake Program Funding Amount	\$25,000
Local Corps Office Funds (total expended on labor, materials, contracts, etc.)?	\$10,000
Partner's Contributions (total value of funds, goods, services, volunteer hours, etc.)	
Partners Name	Total Value of Contributions
1 Kennesaw State University	\$100,000
2	\$
3	\$
4	\$
5	\$
6	\$
7	\$
8	\$
9	\$
10	\$

6. Handshake Program Recipient Feedback

Please take this opportunity to provide feedback on all aspects of the Handshake Program and the Challenge Partnership Agreement authority. Your productive comments are important to the ongoing improvement of the program. Make sure to let us know how the Handshake funds have benefited your efforts to initiate and/or strengthen your partnerships.

I feel that the Handshake Program and Challenge Partnership Agreements are a fantastic program to allow projects to accomplish new and sometimes unique work. Interpretation can become stale, and technology is the new way of learning. Through this program Carters Lake was able to accomplish things which it could never accomplish on its own. The ability to purchase this equipment was made possible by the award funding. In the climate of shrinking budgets at the project level, this program may become ever more vital for helping projects to build, create, or maintain new features for the visiting public or sustainment of public lands.

7. Handshake Summary:

Please also include a separate newspaper type article describing the project and the benefit to the Corps of Engineers and to the public as a result of this partnership project. Examples can be found on the gateway under [Handshake Success Stories](#).

-----See Additional New Release Document-----