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Current in the Creek

Applications are now being accepted for our 2015 Creek Camps!

Session I: June 21-26

Session II: July 5-10

Current 9th & 10th graders should go to: <http://sites.allegheny.edu/creekconnections/creek-camp/> for more information.

Augmented Reality Sandbox Allows Students To See Three-Dimensional Topographic Maps in Real Time and Even “Make It Rain”

By Camille Sicker, Allegheny College Student

Allegheny College has gained a new piece of technology, the Augmented Reality (AR) sandbox, that combines the playfulness of a child’s sandbox with advanced technology to create a learning tool that can be used by students of all ages. When students shape the sand, a Microsoft Kinect 3D camera and a projector with powerful software detect the movement and display a three-dimensional topographic and colored elevation map in real time.

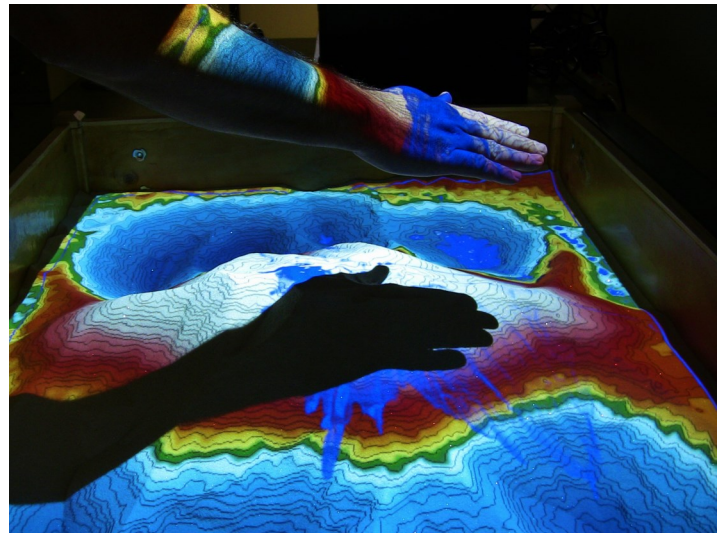
Unlike street maps, topographic maps display three-dimensional characteristics of an area using lines, called contours, to represent elevation above or below sea level. Using topographic maps, engineers know where best to build a road, scientists know where rainwater will flow after a storm and hikers know where a trail is steepest.

Students can have a hard time understanding the connection between a two-dimensional map and a three-dimensional world. But with the AR sandbox, students can build any three-dimensional landscape in the sand and view the changes in topography and elevation as a two-dimensional map.

The AR sandbox began with a group of Czech researchers who posted a YouTube video displaying an early prototype that included elevation maps and a basic form of fluid movement. A team at the W.M. Keck Center for Active Visualization in the Earth

Sciences (KeckCaves) at the University of California Davis then added the topographic contour lines and improved the simulated fluid flow to create the current prototype. UC Davis provides the blueprints to build the system as well as the necessary software free of charge on their website.

Built through an education grant from the Department of Environmental Protection, with matching funds from Allegheny College, the college’s AR sandbox is attracting the notice of numerous departments and organizations. Creek Connections, an environmental education outreach program focused on the French Creek watershed, is incorporating the AR sandbox in activities that explore topographic maps, watersheds and stream geology.



AR Sandbox, Continued from front page

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“Topographic maps are used across curricula and majors,” said Wendy Kedzierski, project director of Creek Connections. “It’s a basic concept that educators don’t want to spend a lot of time on, and they often assume the students already have an understanding of the concept. So the AR sandbox can quickly fill that learning need through hands-on and visual education. The sandbox brings tactile learning to the map world.”

The college’s geology department plans to take advantage of the sandbox in labs such as introductory physical and environmental geology, upper-level classes including geomorphology and hydrogeology, and independent research projects. Environmental science, biology and computer science are also part of the collaboration and plan to incorporate the AR sandbox into their class curricula.

The sandbox has an additional feature that opens yet another educational door: it can simulate

water. Users can “make it rain” simply by extending their hand over an area. Simulated water flow can be used for a wide range of activities, including allowing students to view where rain will fall within watersheds.

“Students in both the Environmental Spatial Analysis and Remote Sensing courses would greatly benefit from the hands-on interaction that the sandbox provides as they learn to read, interpret and utilize topographic maps in support of spatial data collection and analysis,” said Chris Shaffer, Geographic Information System (GIS) manager in the college’s Department of Environmental Science.

Sam Reese, lab technician for the geology and environmental science departments, maintains and facilitates the use of the system. “The AR sandbox is a sign of the future,” he said. “I predict that augmented and virtual reality will play increasingly important roles in the pedagogy of spatially oriented sciences.”

New Regulations for Crayfish

By: David Olson, Allegheny College Student

In January of 2015 the Pennsylvania Fish and Boat Commission implemented a new law regarding crayfish in Pennsylvania waters. This new law states that any and all crayfish removed from a body of water must first have their heads removed behind the eyes prior to transport. While this measure may seem slightly extreme, it is necessary in order to prevent further spread of the Rusty Crayfish (*Orconectes rusticus*) within the state.

The Rusty Crayfish is an invasive species native to Indiana, Eastern Ohio, and Northern Kentucky. Outside of this range however, this species often outcompetes and eliminates native crayfish due to their aggressive behavior and opportunistic feeding habits. Studies around the Great Lakes have shown that Rusty Crayfish, aside from displacing native crayfish, can also lower aquatic plant diversity and fish diversity in some areas. Crayfish identification can be difficult:



Regardless of identification, all regulations of the Pennsylvania Fish and Boat Commission should be followed. So remember to either return crayfish immediately upon capture to the waterbody where they were taken from, or remove the head behind the eyes if you are planning to transport to another water body to use as bait.

***O. rusticus* can be most easily identified by the unique shape of its claws with dark bands at the tip, and the distinctive rust colored spots on either side of its carapace.**

Feature Creature

By Paul Sutkowski, Allegheny College Student

I'm a large rodent that looks like a combination of a beaver and a rat. I have long, thick fur to keep me warm in cold waters and webbed feet for swimming. My tail is covered in scales and I can use it to turn and even swim backwards. I live in cold waters in North America primarily but I have been introduced to cold waters in Europe and Russia. Even in this cold water I am an excellent swimmer and can stay underwater for 15 minutes and I can even eat underwater.

I breed from late winter to September. Females of my kind can have 5 litters per

year and almost 10 young in each litter. THAT'S 50 OFFSPRING IN LESS THAN A YEAR! I live in a large group with my family inside of a lodge that I make from cattails and other plants. I also make tables for my family to eat off of in our home. When my family and I move out of our home, other creatures like snakes, geese, and raccoons will come to live in it. Who am I?



See back page for answer.

Testing Tip

By Paul Sutkowski, Allegheny College Student

If chemicals or sample water are left in the containers, they may alter your results the next time you use the test kit. Each and every time you use a test, it is important that you clean all of the chemicals and sample water from inside the testing containers. For a real tough job, you can even use coarse-bristled brushes to scrape the bottom and sides of the containers (ask your teacher or a Creeker if you would like to obtain one of these). Always rinse out with distilled water when you are done!





Above: Cochran High School students looking for their leaf packs November, 2014.

Feature Creature Answer: from page 3
Muskrat. *Ondatra zibethicus*

Connect with

CREEK CONNECTIONS

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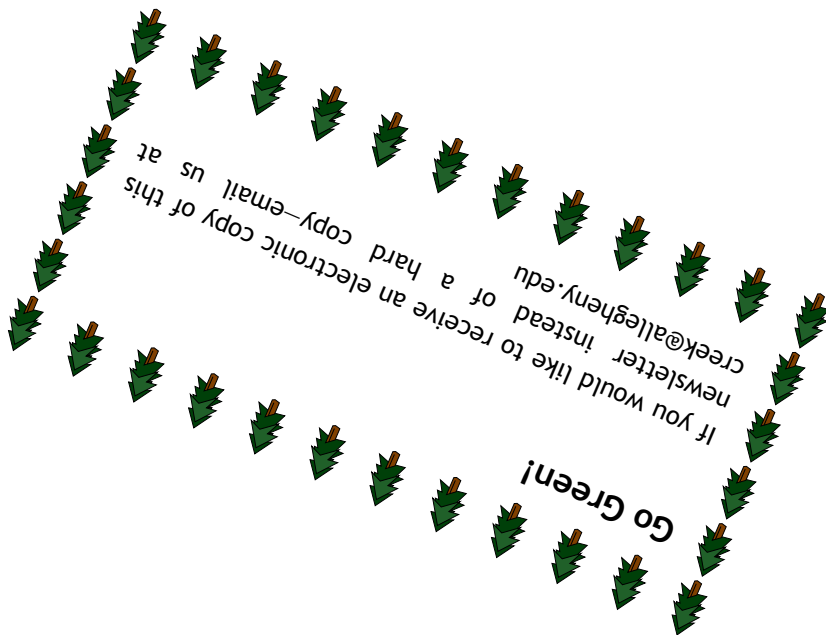
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