



Grace intern Jason Ackerman presenting an ESRI StoryMap presentation on how his community has changed over time using his summer Time Traveler GIS work

# TRANSFORMING HISTORICAL EDUCATION WITH GIS

RANDALL E RAYMOND REPORTS ON A PROJECT TO GIVE DISADVANTAGED CHILDREN GIS SKILLS BY HELPING THEM TO BRING LOCAL HISTORY TO LIFE

Imagine that you could explore the history of your neighbourhood, recreating the past by capturing valuable historical building and community infrastructure data using GIS technology. This year, visitors to Keweenaw National Historical Park (KNHP) in Calumet, Michigan, in the US will be able to use an online atlas – the Keweenaw Time Traveler – to find out where any local resident from the past 100 years lived, worked and attended school or religious activities. High school students, local teachers, university researchers, National Park Service employees and local historical societies are collaborating on this innovative approach to help bring the past to life through interactive applications of GIS and the Esri Story Maps platform as part of the ‘Grace project’.

Located in Michigan’s ‘Copper Country’, Calumet was once a vital and important centre of economic growth and prosperity from the 1860s through to 1960 because of the region’s vast deposits of copper. The Keweenaw Time Traveler is an interactive, data-rich online atlas for the Copper Country, developed at Michigan Technological University (MTU), that combines historic maps and biographical data to recreate the entire, built environment of this region over the past 100 years. When it opens for public use this summer, the historical geoportal will enable researchers and the public alike to automatically match residents’ names with their exact dwellings, workplaces, classrooms and congregations. Users will be able to place their historical stories

and photographs, and trace people and places through time. They will be able to take modern-day tours of the mining centres of the past and ‘see’ what the built environment was like using Esri Story Maps to explore and plan their travels throughout the 240km KNHP route. They will be able to trace changes over time. Further plans call for the use of Esri’s City Engine to ‘render’ the cities in 3D and create virtual walk-throughs of some of the most important economic areas of Michigan.

## Good Grace

The GIS Resources and Applications for Career Education (Grace) project, funded by The National Science Foundation – Innovative Technology Experiences for Students and Teachers (NSF – ITEST), is designed to give high school students and teachers in economically disadvantaged and rural communities in the US an opportunity to learn to use and apply GIS skills and technology in the real world.

Grace builds on an earlier successful NSF-ITEST project, Mayor’s Youth Technology Corps (MYTC), established in 2008 in public schools in Detroit, Michigan. MYTC developed a model of purposeful applications of technology-based education using GIS and community-based problem-solving activities that place 98 high school student GIS interns in 13 different City of Detroit departments using their GIS skills to assist in problem solving activities. This type of high-tech career development in the workplace enables youth



Keweenaw National Historical Park staff working with Grace interns to map their routes to school and areas of their community that need improvement



Grace interns learning advanced GIS techniques while building the Keweenaw Time Traveler at Michigan Technological University



in economically disadvantaged and rural communities to have opportunities to determine their own futures while assisting their communities with the development of valuable GIS data.

The Grace project takes the MYTC model and spreads it throughout Michigan. Under the direction of Yichun Xie of Eastern Michigan University, it is working with KNHP and MTU's Keweenaw Time Traveler project under the direction of Don Lafreniere to involve students, teachers and local GIS professionals. They work collaboratively, solving community-based problems with GIS while developing skills needed for careers in the rapidly expanding geospatial industry.

### Learning in action

Grace interns prepare for their six-week, 20 hours/week paid experience by successfully completing eight Esri Virtual Campus Courses for a total of 41 hours of online course work. They learn Esri's ArcGIS Desktop and take several courses related to the ArcGIS Online tools, including a series of activities related to Esri Story Map creation.

Eight interns helped lay the groundwork for the Keweenaw Time Traveler by working in ArcGIS Desktop alongside undergraduate and graduate students from MTU, digitising building footprints and creating attribute tables of hundreds of Sanborn Fire Insurance plans and local mining maps representing

Keweenaw, Houghton and Ontonagon counties, Michigan from 1855-1940.

They also created Esri Story Maps about their experiences that demonstrate not only technical proficiency, but also enthusiasm for history and public outreach. Working in pairs, the students used maps and photographs to present the work they did for the Time Traveler, along with some of the field projects that were organised for them.

These Story Maps not only illustrate changed landscapes, but spark conversations about history and preservation, which are key components of the park's visitor education and outreach programme.

In addition to the Story Maps, students also helped the KNHP convert paper information into online, accessible, interactive systems for use by tourists anywhere, anytime.

"It's thrilling to see ArcGIS, and in particular Esri's Story Maps, used so effectively to bring history to life for high school students, and to empower students as researchers and digital storytellers. I'd love to see the Grace project become a model for technology-based education across the country," says Allen Carroll, program manager for storytelling at Esri.

### A lasting impact

The Grace project interns were engaged in independent work and collaborative problem-solving throughout their six-week

## WORK WITH US

Grace interns are really making a difference in many communities in Michigan and the Grace model can easily be used as a template for others looking for ways to engage youth in meaningful learning experiences that lead to great career opportunities in the geospatial industry.

If you are interested in exploring ways to begin, contact Yichun Xie (yxie@emich.edu), Don Lafreniere (djlafren@mtu.edu) or Randall Raymond (randallraymond@gmail.com)

internship. The students built maps that used technology and spatial mapping skills, asked questions, researched historic sites, and developed products that are now available to park visitors and everyone worldwide. Learning GIS and developing Story Maps for KNHP introduced them to new ways of investigating, project helped to reinforce existing partnerships between KNHP, MTU and Calumet-Laurium-Keweenaw Schools, and connect with new people and organisations that share the goal of youth engagement and learning. Park advocacy and awareness is also an indirect outcome, as students and community members who may not have otherwise felt connected to the park came to learn about the park, its mission,

and possible learning and employment opportunities.

"It was great to see the students learn about GIS and gain real mapping skills, but for me the highlight was watching them work through problems and help each other when they'd come up to a hurdle. You could really see their sense of achievement. Another highlight for me was to see how many of the students could start to see history in a new light, using this new technology," says Jo Holt, a historian with KNHP.

This summer, the Grace project, KNHP and the Keweenaw Time Traveler project will employ 20 interns, who will capture building footprints and compile related geodatabases. In collaboration with the Esri Story Maps and City Engine teams, the Grace project and Keweenaw Time Traveler hope to demonstrate how important it is to 'transform historical education using GIS'.

## I'D LOVE TO SEE THE GRACE PROJECT BECOME A MODEL FOR TECHNOLOGY-BASED EDUCATION ACROSS THE COUNTRY

*Randall E Raymond is geographic information specialist at Eastern Michigan University – NSF-ITEST Grace project (<http://nsfgrace.net>)*



Grace project interns with Michigan Technological University faculty and students conducting field work at the 1908 Ahmeek Copper Stamp Mill

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