The University of North Carolina at Pembroke

Department of Biology

Using Mobile Technologies and ArcGIS Online in Preservice Science Teacher Education

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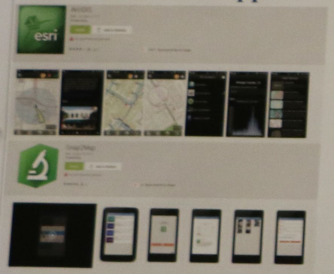
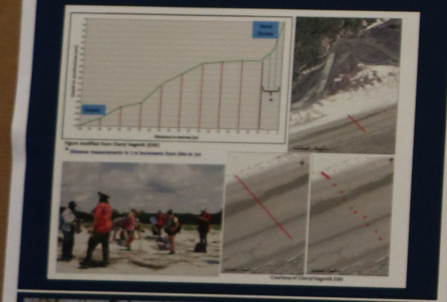
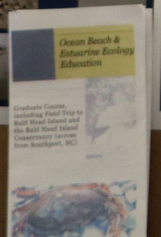
Improving Understanding of Visual Data Using ArcGIS Online on Your Smartphone or Tablet

Collector
ArcGIS Online
Snap2Map
Apps



Beach Profile Group Activity by Student





ArcGIS Online and Org Accounts

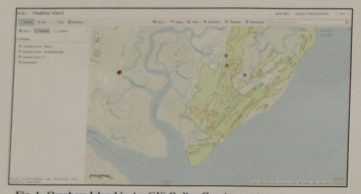


Fig. 1 Ossabaw Island in ArcGIS Online Org Account

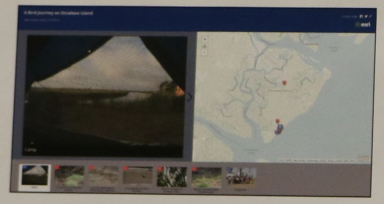


Fig. 2 Story Map by student using ArcGIS Online Org Account

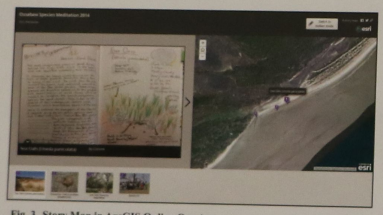
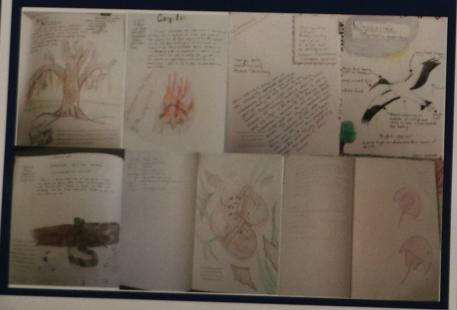


Fig. 3 Story Map in ArcGIS Online Org Account

Nature Journals with GPS Coordinates



Science in the Natural Environment Course Using ArcGIS Online

Goals: The focus of the course is to understand science and inquiry-based instruction in the natural environment through experience. A focus is on performances of authentic science practice in both instruction and assessment. Participants develop inquiry-based units and lessons that focus on the use of the natural environment and wetlands to be used immediately in their classrooms. Participants use technology tools as a part of inquiry-based instruction.

General Concepts: history of science, inquiry, mapping, data collection and analysis, argumentation, nature journaling, classification

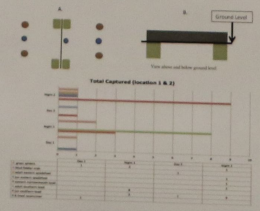
Specific Concepts: global positioning systems, geospatial technologies, birding, astronomy, geology, maritime forests, wetland plants and animals – vertebrate and invertebrate, coastal ecology.

Materials: camping equipment, Last Child in the Woods by Richard Louv, Nature Journaling by Claire Leslie Walker, various field guides.

Assessments: nature autobiography and photovoice, Last Child in the Woods book summary and small group discussion, nature journal, species meditation/GPS and podcast, collection, group experiment, nature teaching improvement plan. Participants present the results of their experiments and write a written report, teach a portion of the nature teaching improvement plan to the class, and submit the nature journal, unit and lesson plans and collection for assessment. Students learn how to set-up and use ArcGIS online Org accounts in their schools.

Group Experiment #1

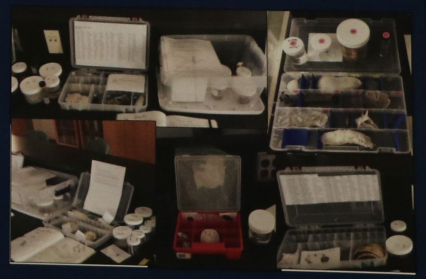
Drop Bucket Survey of Coastal Transition Zones of Ossabaw Island, Georgia



Conclusions and Insights

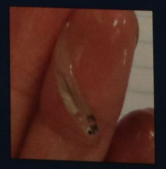
Lessons Learned: Participants in the course were overall pro-environmental before the course began as measured by an Environmental Attitudes Survey. Participants exhibited a slightly increased attitude toward behavior change regarding the environment after the course. Participants remarked that they were unaware of all the garbage generated in a day until handling and disposing of it themselves. Participants learned how to use geospatial technologies and maps in science instruction and were more comfortable "switching" between different technologies. Overwhelmingly the course participants favorite activity was nature journaling and secondly the mapping activities. Using geospatial technologies not only taught participants how to use them in instruction but assisted with data collection and analysis as well as navigation and measuring changes over time on the island.

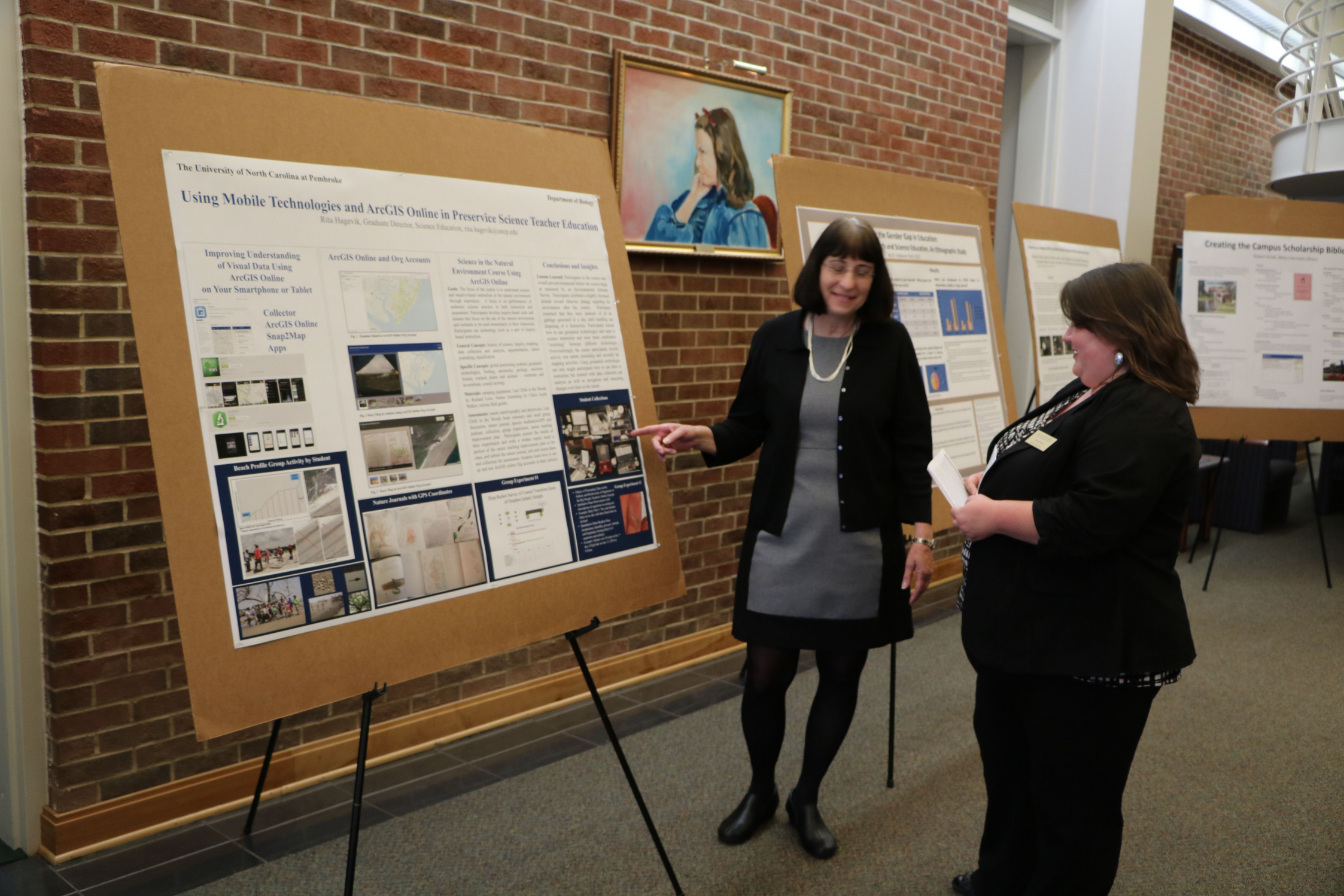
Student Collections



Group Experiment #2

- Effects of Fluctuating Tides on the Salinity and Biodiversity of Organisms in the Big Slough, Ossabaw Island, Georgia
- Qualitative Data-Observations with descriptions of organisms in seining net
- Example: Baby Fish 1: Tiny and slender, shiny on its side with three black dots on its head
- Quantitative Data-Weather Data (temperature, humidity, pressure, latitude, and longitude), Seining Data (# of organisms and salinity)
- Example: Salinity was 18.4 ppt on the 1st day of high tide on June 13, 2014 at 9:45am

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Student Collections
Group Experiment #2
Mapping personal impacts of Matthew


Gap in Education:
e Education, An Ethnographic Study
Ford, Ed.D
Results
Were you introduced to STEM fields in elementary, middle or high school?
Preliminary Analysis of NC and Store Honey Samples for Pollen Content and Purity
Martin B. Farley[1], David A. Wimert[1], Ashley L. Allen[1], Edgardo Lara[1], Daniel Zavala[1], Bridgette Muno
[1]University of North Carolina—Pembroke, [2]Tar Heel Middle School, [3]West Bladen High School
Introduction
Pollen Extraction
Calibrated Lycopodium tablets
Pollen Flora
Table 4. Taste Purity
Honey
Percent Preferred
Big Box Retailer
6%
Columbus County
50%
Wake County
44%
Overview
Scope of the Campus Scholarship Biblio
Book
Book Chapters
Creative Arts
Journal Articles
Newspaper Articles and Reports
Conference Presentations and Proceedings
Reviews
Accomplishments
Grants
Honors/Awards/Achievements
Service
Mentorship