Testing mobile computing to enhance learning in the Earth and Oceanographic Science curriculum

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Geologists rely on sharing their research through journals and map making. The future of data sharing involves mobile computing and digital mapping (Whitmeyer et al. 2012). This summer I tested four different iOS applications measuring strike and dip on both the iPad and the iPhone. These applications are designed for fieldwork specifically in geology. Throughout the months of June and July, I traveled to locations along the coast of Maine where Bowdoin geology courses often visit as part of their lab activities. These testing sites included Little John Island, Two Lights State Park and Giant Stairs, Cape Elizabeth.

Strike and dip is a two-part form of measurement. First, the strike is a measurement of the rock direction in regards to north, south, east or west. And second, the dip is a measurement of the rock angle between 0-90°. Understanding the 3-dimensional orientation of rock units provides geologists with clues into understand geologic histories.

The iOS applications Strike and Dip, GeoID, GeoCompass and MotionX GPS were tested in the field along side the more traditional tool known as the Brunton compass. Measurements from all applications were compared to measurements taken with a calibrated Brunton Compass. In the end, GeoCompass provided the most accurate measurements and sharing capabilities. After data was collected in the field, the next step involved transferring the data into a computer and developing a way to present and share the data.

In order to determine which computer program would best comply with the applications, I decided to test both Google Earth and a similar mapping program called ArcGIS. Each program has strengths and weaknesses when mapping geologic data but ultimately, ArcGIS proved to be most practical for its strengths in displaying data.

The application GeoCompass proved to be the best option for electronic strike and dip measurements as well as data sharing in the computer program ArcGIS. During the 2013 fall semester, the Earth and Oceanographic Science course titled Structural Geology 241 will utilize the application GeoCompass in the field and transfer data into ArcGIS to be displayed on a map. I will have the privilege to see this project through during the fall semester working as a teaching assistant for Structural Geology 241. Practicing the latest techniques such as these applications allows students at Bowdoin to be at the forefront of their field.

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Reference


Image: http://web.mit.edu/12.114/03_fall/www/lectures/compass.htm