



Analyzing meteorological phenomena from the ISS in classrooms – from e-learning to m-learning

Andreas Rienow (1), Annette Ortwein (1), Kilian Staar (2), and Johannes Schultz (1)

(1) Ruhr-University Bochum, Geography, Bochum, Germany (andreas.rienow@rub.de), (2) University of Bonn, Geography, Bonn, Germany

Since 2014, four cameras attached to the ESA Columbus laboratory of the International Space Station (ISS) are observing the Earth twenty-four hours per day and seven days a week. The ‘High Definition Earth Viewing’ (HDEV) experiment is carried out by NASA while the footage is archived by the University of Bonn (UoB) and analyzed by the Ruhr-University in Bochum (RUB). A closer look at the footage shows clearly that clouds dominate space-based views of Earth. One NASA study based on nearly a decade of satellite data estimated that about 67 percent of Earth’s surface is typically covered by clouds. The project ‘Columbus Eye – Live-Imagery from the ISS in Schools’ (UoB and RUB) has published a learning portal for earth observation from the ISS including a large educational portfolio on meteorological phenomena like thunderclouds, hurricanes, depressions, and noctilucent clouds (<http://columbuseye.uni-bonn.de/>). The didactical paradigm focuses the everyday school curriculum of Geography lessons. The presentation deals with two digital and interactive learning tools: the first one enables pupils to classify the HDEV footage on their own in order to create a land-cover map. Additionally, the pupils can calculate the area of cloud coverage and try to differentiate between snow and ice on one hand and clouds on the other hand. The next step shifts from e-learning to m-learning. The teaching unit ‘The Eye of the Cyclone’ (<http://columbuseye.uni-bonn.de/english/>) uses augmented reality to address typhoon movements and pressure characteristics in a mobile app. A static isobaric map of the typhoon ‘Maysak’ turn dynamic and its vertical plan is augmented by the fascinating views from space. In doing so, the astronaut’s perspective becomes a tangible experience in regular school lessons.