

Temporal Trends in Surface Water Area using the Landsat Archive

Presented by Frank Witmer



Abstract: Detecting and monitoring surface water trends over time is important for applications such as water cycle dynamics, historic flooding extent, and agricultural productivity. For Arctic regions, climate change is affecting freshwater availability by melting glaciers, changing seasonal rates of precipitation, and increasing evapotranspiration. For the Kenai Peninsula, prior research shows a decline in water availability, due primarily to reduced precipitation, but also to higher summer temperatures. Measuring surface water and identifying temporal trends is necessary for assessing potential impacts and vulnerabilities to human and natural systems. This research uses the available Landsat archive and analytical capabilities of Google Earth Engine to extract time series

data for four watersheds on the Kenai Peninsula, Alaska. Water area is classified using a machine learning approach and evaluated using the 2011 National Land Cover Database (NLCD). Overall classification accuracies and individual accuracies for each land cover category are reported. This method of surface water extraction is flexible and should generalize well to other areas.

Biography: Frank Witmer is a computational geographer who conducts research in violent conflict and human-environment interactions using spatial statistical methods, remote sensing data, and simulation. He also uses immersive visualization technology in the [Planetarium and Visualization Theater \(PVT\)](#) to study the effects of environmental changes on salmon and Alaska fisheries. He currently teaches classes in both the Computer Science and Geomatics departments at UAA.

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