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Developing high-resolution global lake GIS database from landsat images

This presentation uses lake mapping to showcase turning remote sensing data into GIS products at global scales. Lakes are important water resources and play a crucial role in the global water cycle, but are sensitive to climate change and human activities. Mapping dynamics of global lakes is rather challenging due to their high abundance and low accessibility. With its broad spatial coverage and monitoring capability, satellite remote sensing is the only feasible approach to inventory global lake dynamics but requires thousands of high-resolution satellite images, automated mapping algorithms and more importantly tedious yet essential quality assurance and quality control (QA/QC) procedures. In our USGS- and NASA-funded projects, millions of lakes have been mapped from thousands of Landsat images acquired at lake-stable seasons and have gone through intensive QA/QC procedures. A set of highly replicable automated lake mapping tools have been developed to tackle various situations across the entire Earth. These mapping tools treat individual lakes as objects, and produce each lake as a GIS polygon. Commission and omission errors in lake mapping need to be identified and mitigated through intensive QA/QC processes. However, QA/QC of such a huge quantity of lakes is a great challenge. We have developed an automated QA tool and a semi-automated QC tool in a GIS environment to reduce the workload for manpower. The circa 2000 high-resolution systematically-generated global lake GIS database with adequate QA/QC will be released shortly. The circa 2015 database is being produced using Landsat 8 images.

Biography

Yongwei Sheng has completed his PhD in 2000 from University of California, Berkeley. He is currently a Professor at Department of Geography, University of California, Los Angeles (UCLA). He has published more than 80 papers in reputed journals and is currently serving in NASA Landsat Science Team and NASA SWOT Mission Science Team.

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