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The U.S. Geological Survey Dynamic Surface Water Extent product evaluation strategy

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The USGS has developed a Dynamic Surface Water Extent (DSWE) landsat science product to meet broad scientific and resource management needs. Product usability is a primary goal for this effort. Rigorous measurement and reporting of product uncertainty as well as the evaluation and refinement of product utility are necessary to achieve this goal. To appropriately balance information provided against cost of implementation, a multi-tiered strategy is employed to evaluate and document DSWE uncertainty and utility for potential users. To refine the product from a user's perspective, foster unbiased product assessment, and stretch development resources as far as possible, the final tier of evaluation is performed collaboratively. Evaluation study areas and time frames are selected to provide the greatest challenges to DSWE performance and to provide coincident, independent sources of inundation information, respectively. While DSWE is currently based on Landsat alone, data from passive and active sensing systems from numerous airborne (to include unmanned airborne systems) and satellite-based platforms are processed using automated and manual approaches to yield polygon and point based validation data. In situ data on inundation and water stage collected at key U.S. study areas are also used both to understand DSWE weaknesses and facilitate DSWE use in science and resource management. The effectiveness of this approach is illustrated through case studies drawn from DSWE prototype product evaluation for hydrologic modeling and flood inundation mapping.