



Information Technology and Software

# Landslide Hazard Assessment for Situational Awareness (LHASA)

Determining regional landslide probability in near real-time

As with all natural disasters, the catastrophic effects of landslides are most effectively mitigated when early forecasting provides sufficient time for the planning and execution of emergency operations prior to the event. Landslide hazard risk has proven exceptionally difficult to predict in part due to the limited availability of landslide data, rain gauges (particularly in remote areas and developing countries), and surface variables such as topography. In response, NASA Goddard Space Flight Center has developed a framework utilizing remotely sensed data and a simple decision tree model to calculate regional landslide susceptibility. The high volume of acquired data, near real-time sampling frequency, and global coverage of remotely sensed data provides important input that allows this innovative process to render a more accurate and up-to-date landslide hazard assessment than previously possible.

## BENEFITS

- Flexibility: model can easily be catered to user requirements
- Up-to-date forecasting: satellite-sensing provides updated data in near real-time
- User-friendly online interface

technology solution



# NASA Technology Transfer Program

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## THE TECHNOLOGY

While previous models have largely considered either regional susceptibility or rainfall intensity and duration in their calculations, LHASA considers both of these variables through the integration of regional landslide susceptibility maps and satellite-collected rainfall estimates into a binary decision tree model. This model employs a regionally distributed, percentile-based threshold approach to produce a pixel-by-pixel nowcast in near real-time and at a resolution of 30 arcseconds to identify regional areas at moderate or high landslide hazard risk. An unprecedented degree of flexibility allows end users to tailor the LHASA model for increased situational awareness by interchanging model components and adjusting or calibrating thresholds based on newly available data. In addition, an intuitive online interface enables current landslide hazard observation on a global map and provides context for users to look more closely into landslide hotspot areas.

## APPLICATIONS

The technology has several potential applications:

- Assessing landslide probability in an area of interest (useful for reinsurance companies, international aid organizations, and emergency response groups, among others)

## PUBLICATIONS

Patent Pending

National Aeronautics and Space Administration

**Strategic Partnerships Office**

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NP-2016-11-2244-HQ

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GSC-17452-1  
GSC-TOPS-176

