

Project objectives:

-Artisanal and small scale gold mining (ASGM) is estimated to release between 640 and 1350 tonnes of mercury per annum into the environment (Telmer and Veiga, 2008).

-ASGM can be difficult to monitor using traditional composite imagery because it is frequently concentrated in regions of heavy cloud cover. Here we utilize the all weather capability of PALSAR to monitor areas of ASGM activity at short time scales.

-Information extracted from PALSAR imagery will be integrated into the existing ASGM knowledgebase and management programs.

Methods:

-Acquire repeat pass PALSAR imagery for areas of interest.

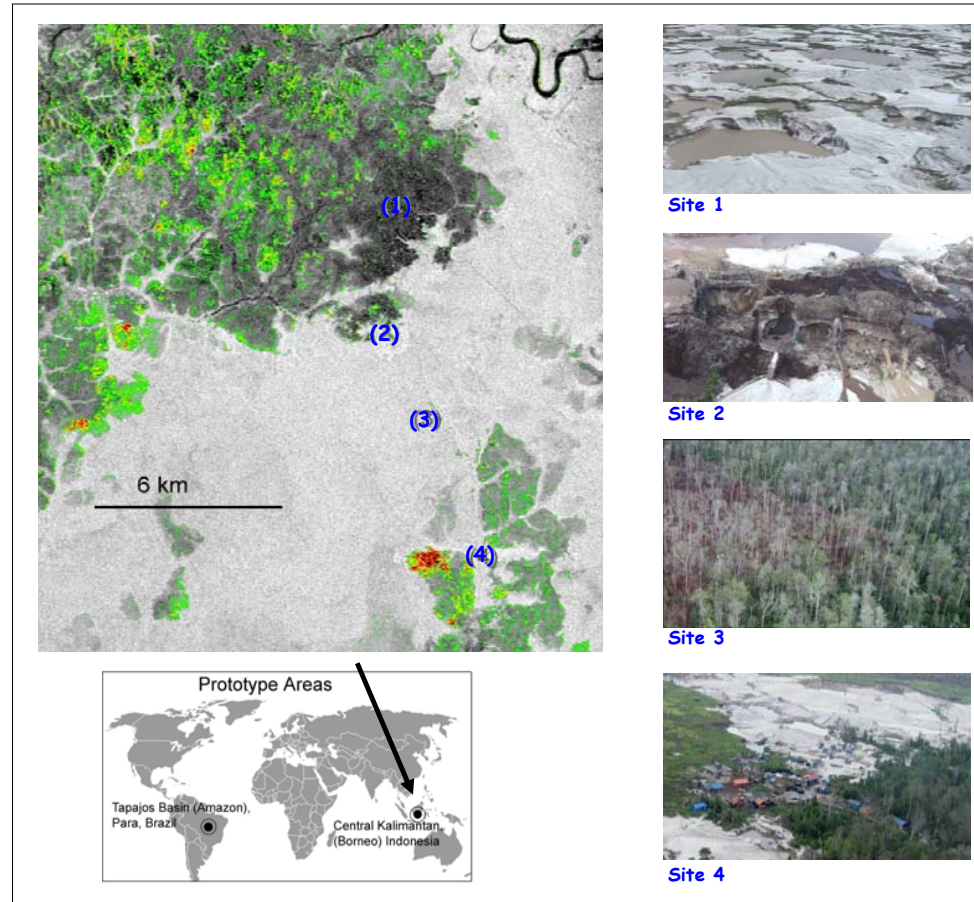
-Apply change detection algorithms to identify areas of relative topographic change.

-Confirm results using ground truth and aerial photography.

Results:

-PALSAR shows promising results for monitoring ASGM activity over short time scales.

-Change detection analysis in central Kalimantan shows continued development of existing ASGM sites as well as new ones over just a few months.

Monitoring Artisanal and Small Scale Gold Mining activity with SAR: Mid-term results

Above: A change detection map of the Galangan sand fields of central Kalimantan derived from multiple PALSAR scenes collected between June and November 2006 (ground truth aerial photographs were simultaneously collected). Colors correspond to degrees of change in the four month period between June and September (Green = moderate, yellow = large, red = extreme). At site 1 some 2000 hectares appear totally vacant with no change. The corresponding aerial photo confirms the mine fields here have been completely abandoned. Active pit operations (where heavy machinery is being used to dig pits) are operating at site 2. Site 3 shows the burning and removal of vegetation - the precursor to mining operations while site 4 shows a new remote ASGM community being established in the jungle. Right hand figure: An excerpt from the ASGM online pilot database Hg watch. Information extracted from the PALSAR images will help to refine the spatial and temporal resolution of current ASGM activity and associated mercury use.

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ALOS PALSAR data used:

-Localized PALSAR FBS/FBD Level 1.5 imagery over Indonesia and Brazil

Other data sources:

-High resolution satellite imagery (Landsat, Spot, Quickbird) and aerial photography.



Source: <http://hgwatch.uvic.ca/index.html>

References:

Telmer, K. H., Veiga, M. M. 2008. World emissions of mercury from artisanal and small scale gold mining and the knowledge gaps about them.

