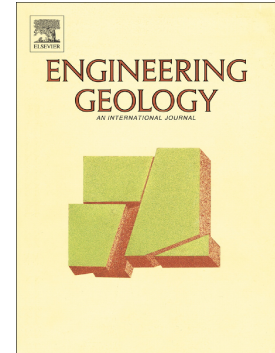


## Accepted Manuscript

Monitoring tropical peat related settlement using ISBAS InSAR,  
Kuala Lumpur International Airport (KLIA)

Chris Marshall, David J. Large, Ahmed Athab, Stephanie L.  
Evers, Andrew Sowter, Stuart Marsh, Sofie Sjögersten



PII: S0013-7952(17)31683-6  
DOI: doi:[10.1016/j.enggeo.2018.07.015](https://doi.org/10.1016/j.enggeo.2018.07.015)  
Reference: ENGEO 4894  
To appear in: *Engineering Geology*  
Received date: 20 November 2017  
Revised date: 16 July 2018  
Accepted date: 17 July 2018

Please cite this article as: Chris Marshall, David J. Large, Ahmed Athab, Stephanie L. Evers, Andrew Sowter, Stuart Marsh, Sofie Sjögersten , Monitoring tropical peat related settlement using ISBAS InSAR, Kuala Lumpur International Airport (KLIA). *Enggeo* (2018), doi:[10.1016/j.enggeo.2018.07.015](https://doi.org/10.1016/j.enggeo.2018.07.015)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

## Monitoring Tropical Peat Related Settlement using ISBAS InSAR, Kuala Lumpur International Airport (KLIA)

Chris Marshall<sup>a,b\*</sup>, David. J Large<sup>b</sup>, Ahmed Athab<sup>c,a</sup>, Stephanie. L. Evers<sup>d,e,f</sup>, Andrew Sowter<sup>c</sup>, Stuart Marsh<sup>a</sup>, Sofie Sjögersten<sup>g</sup>

<sup>a</sup> Nottingham Geospatial Institute, Triumph Rd, The University of Nottingham, Nottingham NG7

2TU\*Corresponding author – christopher.marshall@nottingham.ac.uk

<sup>b</sup> Department of Chemical and Environmental Engineering, The University of Nottingham, University Park, Nottingham, NG7 2RD

<sup>c</sup> Geomatic Ventures Ltd., Nottingham Geospatial Building, Triumph Road, Nottingham NG7 2TU

<sup>d</sup> School of Natural Sciences and Psychology, James Parsons Building, Byron Street, Liverpool, L3 3AF

<sup>e</sup> Tropical Catchment Research Initiative (TROCARI)

<sup>f</sup> University of Nottingham, Malaysia Campus, School of Biosciences, Jalan Broga, 43500 Semenyih, Selangor Darul Ehsan, Malaysia

<sup>g</sup> School of Biosciences, The University of Nottingham, Sutton Bonington Campus, Sutton Bonington, Leicestershire, LE12 5RD

Rapid population growth in South-East Asia has placed immense pressure upon lowland regions both to supply food and employment and space for residential, commercial and infrastructure development. This pressure has led to sites on tropical peatland previously considered unsuitable for development to be revisited. One such site, the KLIA2 terminal and runway, Kuala Lumpur International Airport which opened in May 2014 at a cost of 3.6 billion MYR has been beset by well documented subsidence problems. Coverage of the tropics by the Sentinel-1 satellite constellation presents an opportunity to monitor the ongoing subsidence at KLIA 2, identify potential knowledge gaps and help inform more sustainable infrastructure development in tropical peatland regions. Our results show that the ISBAS InSAR method produces reproducible ground deformation maps which can clearly identify the patterns of deformation across both urban infrastructure and adjacent rural plantations and tropical peat swamp. This is particularly well defined around the terminal building at KLIA-2 where different ground preparation and foundation design have resulted in stable terminal buildings and subsidence of surrounding pavement. Deformation is greatest in the runway area where alternate bands of uplift and subsidence presumably accompany the greatest loads associated with landing aircraft. In contrast, areas where peat replacement was the primary form of ground preparation, ground motion is stable, however this comes at high economic and environmental cost.

### Keywords

InSAR; Intermittent SBAS (ISBAS); Subsidence; Kuala Lumpur Airport; Tropical Peat, Settlement

Download English Version:

<https://daneshyari.com/en/article/8915779>

Download Persian Version:

<https://daneshyari.com/article/8915779>

[Daneshyari.com](https://daneshyari.com)