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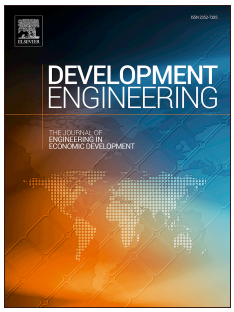

Utilizing publicly available satellite data for urban research: Mapping built-up land cover and land use in Ho Chi Minh City, Vietnam

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PII: S2352-7285(17)30084-2

DOI: 10.1016/j.deveng.2018.03.001

Reference: DEVENG 27

To appear in: *Development Engineering*

Received Date: 18 October 2017

Revised Date: 21 February 2018

Accepted Date: 19 March 2018

Please cite this article as: Goldblatt, R., Deininger, K., Hanson, G., Utilizing publicly available satellite data for urban research: Mapping built-up land cover and land use in Ho Chi Minh City, Vietnam, *Development Engineering* (2018), doi: 10.1016/j.deveng.2018.03.001.

Utilizing Publicly Available Satellite Data for Urban Research: Mapping Built-up Land Cover and Land Use in Ho Chi Minh City, Vietnam.

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Abstract. Urbanization is a fundamental trend of the past two centuries, shaping many dimensions of the modern world. To guide this phenomenon and support growth of cities that are competitive and sustainably provide needed services, there is a need for information on the extent and nature of urban land cover. However, measuring urbanization is challenging, especially in developing countries, which often lack the resources and infrastructure needed to produce reliable data. With the increased availability of remotely sensed data, new methods are available to map urban land. Yet, existing classification products vary in their definition of "urban" and typically characterize urbanization in a specific point (or points) in time. Emerging cloud based computational platforms now allow one to map land cover and land use (LC/LU) across space and time without being constrained to specific classification products. Here, we highlight the potential use of publicly available remotely sensed data for mapping changes in the built-up LC/LU in Ho Chi Minh City, Vietnam, in the period between 2000 and 2015. We perform a pixel-based supervised image classification procedure in Google Earth Engine (GEE), using two sources of reference data (administrative data and hand-labeled examples). By fusing publicly available optical and radar data as input to the classifier, we achieve accurate maps of built-up LC/LU in the province. In today's era of big data, an easily deployable method for accurate classification of built-up LC/LU has extensive applications across a wide range of disciplines and is essential for building the foundation for a sustainable human society.

Keywords: urbanization, built-up land cover, Landsat, Sentinel, Google Earth Engine.

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1. Introduction

Urbanization is a fundamental trend of the past two centuries and a key force in shaping many dimensions of the modern world. Between 1950 and 2014, the share of the global population living in urban areas increased from 30% to 54%; over the next few decades, the global urban population is projected to expand by an additional 2.5 billion individuals, primarily in Asia and Africa (UN, 2014). In the next 15 years alone, the global land area incorporated in cities is projected to grow by 1.2 million km^2 (Seto