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"FRONTIERS IN EARTH OBSERVATION"

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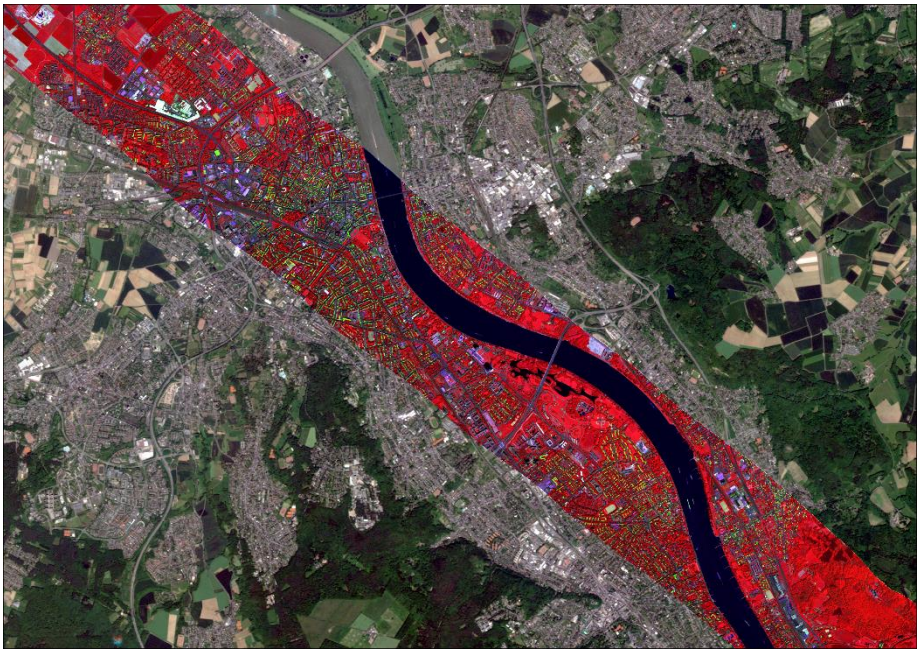
BONN, GERMANY



PROGRAMME & ABSTRACT BOOK

DEPARTMENT OF GEOGRAPHY
UNIVERSITY OF BONN

Geographie

CENTER FOR REMOTE SENSING
OF LAND SURFACES

ZFL

European Association
of Remote Sensing
Laboratories

universitätbonn

36th EARSeL Symposium
"Frontiers in Earth Observation"

20-24 June, 2016
Bonn, Germany

Programme & Abstract Book

Edited by:
Gunter Menz, Klaus Greve, Oliver Balthesen,
Andreas Rienow, Olena Dubovyk, Frank Thonfeld

University of Bonn, Department of Geography,
Bonn, 20-24 June 2016

Published for:

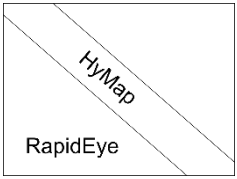
EARSeL – European Association of Remote Sensing Laboratories
University of Bonn, Department of Geography and Center for Remote Sensing of Land Surfaces

Bonn, 2016

Printed in Germany:

Rheinische Friedrich-Wilhelms-Universität Bonn
Abteilung 4.1 – Druckerei
Am Hof 1, EG, Raum 0.074
53113 Bonn

Cover design:
Valerie Graw, Javier Muro (University of Bonn, Germany)
HyMap: Date: 2005/05/28; Bands: 56, 124, 11 (False Color Composite)
RapidEye: Date: 2010/06/03; Bands: 3, 2, 1 (True Color Composite)
City of Bonn and its surroundings.



Analysing the Diversity of Deprived Areas in Mumbai, India

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Many cities in the Global South are facing high developing dynamics and rapid growth of areas with poor living conditions, such areas offer shelter to 1/3 of the urban population in the Global South (UN-Habitat, 2015). The municipal data sets on slums and other deprived areas are often not keeping pace with the high developing dynamics, causing that data are often incomplete, inconsistent, outdated or even absent. Aggregated data such as census-based statistics on wards mostly refer to relatively large and heterogeneous areas, which are often meaningless geographical units. In the last decade, several remote sensing studies developed methods for the extraction of slums, however, very few studies focused on the diversity of deprived areas. Such areas are ranging from unrecognized slum areas (often in the proximity of hazardous areas) to regularized areas with poor basic services. The city of Mumbai, India is an illustrative example of such a diversity.

In this paper we examine the capacity of the random forest classifier to analyse spatial, spectral and textural characteristics of deprived areas for the city of Mumbai using 8-Band images of WorldView-2. We have selected an East-West cross-section of Mumbai, which is strongly dominated by a variety of slums and other deprived areas with poor physical living conditions. The research also employs image segmentation to aggregate the results to homogenous urban patches (HUPs) that approximate geographically meaningful neighbourhood units to produce policy-relevant information. The results of spectral, texture and spatial proxies of physical deprivation are evaluated by ground-truth information collected in the field, showing the scope but also the limitations of image based proxies on the diversity of such areas in Mumbai. Thus the research illustrates how image based proxies from VHR imagery helps in rapidly extracting spatial information on deprived areas. These proxies offer a better understanding of their diverse morphological characteristics (e.g. built-up density, texture and shape), and therefore, providing strategic information for urban management when aggregated to HUP.

UN-Habitat. (2015). HABITAT III ISSUE PAPERS 22 – INFORMAL SETTLEMENTS. New York: United Nations Conference on Housing and Sustainable Urban Development.