

RESEARCH AND TECHNOLOGY PROGRESS REPORT

1. Title MEGA URBAN CHANGES AND IMPACTS IN THE DECADE OF THE 2000s		2. Date Prepared 9/27/2015	
3. Performing Organization: Jet Propulsion Laboratory			
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10. Task Order No. NNN13D876T		9. NASA Division Earth Science	
11. Reference(s): ROSES NRA Program Element Title /Proposal #: NNH11ZDA001N-IDS / 11-IDS11-7 Is this a Co-Investigator Task? No Is this an Other than Solicited Task? No			
13. Description <u>Task progress:</u> Used the Dense Sampling Method with the Rosette Transform for urban studies to complete d satellite data processing in 2000-2009 for all 29 mega cities across the world: Tokyo, Guangzhou, Shanghai, Jakarta, Seoul, Delhi, Mexico City, Karachi, Manila, New York City, São Paulo, Mumbai, Beijing, Los Angeles, Osaka, Moscow, Dhaka, Cairo, Kolkata, London, Buenos Aires, Bangkok, Istanbul, Lagos, Tehran, Rio de Janeiro, Shenzhen, Paris, and Tianjin. In addition, per requests from co-Is and collaborators in the science team, we processed many additional cities (including the Great Plains in US). We successfully conducted the extension phase of PO PLain EXpweriment (POPLEX 2015) in northern Italy in July 2015 to identify and understand the influence of urban characteristics and its change on important environmental topics such as: (a) peculiar river flow behaviors between upstream and downstream of Po River, (b) urban gradient and hot spot development such as the area of EXPO 2015, and (c) soil moisture and agricultural changes with urban sprawl. <u>Next plan:</u> The interdisciplinary science team will analyze and publish results using the more complete datasets with the most updated data from satellite observations, surface networks, POPLEX 2015, socioeconomic datasets, demographic surveys, and GATOR-GCMOM modeling. <u>Publications:</u> 1. Nghiem, S. V., Global Mega Urbanization and Impacts in the 2000s, <i>Proc. International Geoscience and Remote Sensing Symposium</i> , Milan, Italy, Jul. 2015. 2. Stevenazzi, S., S. V. Nghiem, and M. Masetti, Urban Impacts on Air Quality Observed with Remote Sensing and Ground Station Data from the Po Plain Field Campaign, <i>Proc. International Geoscience and Remote Sensing Symposium</i> , Milan, Italy, Jul. 2015 3. Masetti, M., S. V. Nghiem, A. Sorichetta, S. Stevvenazi, P. Fabbri, M. Pola, M. Filippini, and G. Robert Brakenridge, Investigating Urban Changes and Environmental Impacts in Italy, 12 pp., accepted, <i>Eos</i> , AGU, Jul. 2015. 4. Jacobson, M., S. V. Nghiem, A. Sorichetta, and N. Whitney, Ring of Impact from the Mega-Urbanization of Beijing between 2000 and 2009, <i>Journal of Geophysical Research, Atmos.</i> , 120, doi:10.1002/2014JD023008, Jun. 2015. 5. Stevenazzi, S., M. Masetti, S. V. Nghiem, and A. Sorichetta, Groundwater vulnerability maps derived from time dependent method using satellite scatterometer data, <i>Hydrogeology Journal</i> , 23(4), 631-647, doi:10.1007/s10040-015-1236-3, Jun. 2015.			
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