Copernicus Sentinels for Urban Planning in Russia: First results from the SEN4RUS Project

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After the launch of the Copernicus Sentinels 1, 2 and 3 by the European Space Agency, the availability of free and open Earth Observation (EO) data streams provides totally new opportunities for innovative scientific and commercial geo-information services. With the given spatial resolution and revisiting times, the potential of Sentinels missions to support a wide range of environmental, regional and urban planning and monitoring applications is high. Recently, the ERA.Net-RUS project GEOURBAN developed a set of EO-based environmental indicators for urban planning and a software tool for their on-line evaluation. GEOURBAN mainly focused on the local city level; however, planning in peri-urban and rural areas is particularly important for Russia, given its huge territory and its high number of large cities and scattered settlements. Standard EO-based spatial datasets, such as the European Urban Atlas have proven to be quite valuable for various urban and spatial planning applications. However, this data just exists for the large and medium European cities, but not for the Russian ones. To this end, the main objective of the SEN4RUS (exploiting Sentinels for supporting urban planning applications at city and regional levels in Russia) project, funded by ERA.Net-RUS Plus, is to take into account the specific requirements of spatial and urban planning in Russia to develop indicators that effectively and efficiently exploit the information content provided by Sentinels mass data streams in support of city and regional planning. SEN4RUS is based on GEOURBAN outcomes, therefore using the expertise and basic techniques developed in the context of GEOURBAN, SEN4RUS will design and implement EO-based services for planners and decision makers that are specifically tailored to the Russian requirements. A key instrument in this context is the further development of a Web-based Information System (WIS), capable of evaluating the EO-derived indicators and provides them in a form that allows easy access and direct implementation into planning procedures. Three Russian cities with different typologies and planning perspectives have been included as case studies: St. Petersburg, Omsk and Vladivostok. To engage the users in the project, a Community of Practice approach is employed. The innovation of SEN4RUS lies in the development of robust techniques for information extraction and derivation of geo-information products from Sentinel satellite imagery in combination with an improved WIS that is adapted to and optimized for the Russian urban and regional planning system and can be easily understood and controlled by non-experts. Adaptation of the SEN4RUS WIS to forthcoming missions have also been planned, therefore a fully operational tool is expected in the future.