

## NSDI development during the War for the reconstruction of Ukraine

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The development of the National Spatial Data Infrastructure (hereinafter – NSDI) and topographic mapping in Ukraine had a positive dynamic before the War with Russia on 24th of February 2022: Law of Ukraine “On National Spatial Data Infrastructure” was adopted in 2020, the Decree of the Cabinet of Ministers of Ukraine “On Approving the Procedure for the Functioning of the National Spatial Data Infrastructure” № 532 was adopted in 2021, a pilot project for the implementation of NSDI was implemented and a geoportal was developed (<https://nsdi.gov.ua/>) during 2020-2021. During the Ukrainian-Japanese project on "Creation of the National Spatial Data Infrastructure in Ukraine" were implemented and 15 harmonized national standards and 1 national profile of the ISO 19100 series "Geographic Information/Geomatics" (2015-2018). During the Ukrainian-Norwegian project "Maps for good land governance" was implemented and the topographic database "Main State Topographic Map" was created (2018-2021).

All these activities were aimed at the implementation of Land reform, Decentralization reform and Open data policy. The new challenges arose for the topographical, geodetic and cartographic industry after the start of a full-scale war in Ukraine caused by Russian aggression: providing the Armed Forces of Ukraine with up-to-date geospatial data, maintaining the proper development of the NSDI in war conditions for the needs of the fields of economy. Open data policies do not work in wartime. The interaction was established with all holders and producers of geospatial data to continue work on the development of the NSDI to ensure the security and defence of Ukraine and for civilian needs against the background of the closure of the network of geoportals, which published official geospatial data of the national and local levels. Further development of NSDI in Ukraine will be aimed at restoring the state's economy, rebuilding destroyed territories and objects of residential and public construction, critical infrastructure, etc. Recovery and reconstruction processes must be provided with high-quality, up-to-date and official geospatial data on the required territory, which will be achieved by integrating the core reference and thematic geospatial data. Certain activities are being taken to develop the NSDI to ensure the reconstruction of Ukraine despite wartime. First of all, this is a solution to the problem of integrating geospatial data from different holders. Geoinformation resources are created by different holders according to the departmental principle using different coordinate systems and different software, etc. Therefore, the problem of ensuring the interoperability of these data becomes very important. In addition, the created departmental geospatial data are not documented and there is practically no metadata on them. Therefore, the direction of NSDI development consists of the creation of appropriate legislative work aimed at the integration of disparate data, ensuring the development of specifications for geospatial data and metadata that would correspond to the level of development of geoinformation technologies, and organizational work to establish the interaction of holders within the framework of the Coordination Council with NSDI.

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