



## **Spatial segmentation of inland water surface using C-band synthetic aperture radar images on the Great Hungarian Plain**

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Extreme water management situations (for instance inland water) are a growing challenge, which are concern in agricultural production not only worldwide but in Europe and in Hungary. Due to the climate change – which effects are increasing the problems – are getting ever greater. The spatial and temporal limitation of inland water is a major task of the examinations of these phenomenon. The main objective of my study was to examine the spatial and temporal limitation of inland water and based on these to produce more accurate, more comparable and globally interpreted results.

One possible solution could be to monitor the inland water using microwave remote sensing. Thus, the runoff parameters of inland water were evaluated using radar remote sensing technologies in our research. The sample area was the Szolnok-Túr-Plain, which is located in the middle of the Plain Great Hungarian Plain. The inland water patches were isolated using Sentinel 1 satellite images in the sample area. Sentinel 1 data were acquired from the European Space Agency (ESA) website, from 1 January, 2015 to 31 December, 2015. Radar images were processed in the ESA Sentinel Application Platform (SNAP) 2.0 software environment. The detected water surface were correlated with different land cover categories (non-irrigated arable land, grasslands and pastures) based on Corine Land Cover 2012 database.

Based on the radar data, the inland water areas were 507.52 hectares in March, 161.23 hectares in April and 105.95 hectares in July in the case of non-irrigated arable lands. For grasslands, the area of inland water were 0.42 hectares in March and 0.43 hectares in April. In the other period, there was no inland water on the sample area. In case of pastures, inland water were occurred in the whole investigation period, among these zones were particularly high at June (337.14 hectares) and at July (1113.67 hectares).

Based on the results, the inland water surface can be more clearly defined with spatial segmentation of Sentinel 1 images, and it could help in water management planning.

**Keywords:** inland water, Sentinel 1, SAR

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