NCG

Netherlands Center for Geodesy and Geo-informatics

Abstract submission for the NCG Symposium 2020

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Presentation title: Detection strategies for impending sinkholes based on InSAR data

Demo: no

Abstract (~100 words and optionally 1-2 figures):

Identifying impending sinkholes is very difficult, since (i) the location and time of occurrence is not known a-priori, (ii) the signs at the surface are often very limited, and (iii) lead times can be very short. Various in situ methods such as coring, GPR and seismic reflection are expensive, spatially limited, and do not take the temporal changes into account.
InSAR is able to detect subsidence cheaply and over a wide area. However, detecting impending sinkholes using InSAR is still a challenge due to the limited spatio-temporal extent of the phenomenon, the slow buildup of expertise, the lack of methodology, and the limited understanding of the signals of interest.

Here we use InSAR scatterers to try to find a relationship that would suggest the presence of an impending sinkhole. The research focuses on the spatial and the temporal characteristics of an impending sinkhole. For the spatial characteristics we use empirically derived relationships such as influence functions to describe and approximate the surface expression. For the temporal characteristics we look at irregular behavior of a scatterer. Combining these methods should result in a system that would be able to generate a warning whenever certain conditions for an impending sinkhole are discovered in the InSAR data.