



Investigation of Land Subsidence using ALOS PALSAR data: a case study in Mentougou (Beijing, China)

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Mining activities have been documented for centuries in Mentougou, and land subsidence resulting from mining operations has already been known over the past few decades. However, there has been ongoing concern that excessive groundwater extraction may lead to further subsidence. Therefore it is critical to map the land cover changes to understand the actual impact of these activities. So, the land cover changes from 2006 to 2011 were examined based on multi-source remote sensing imageries(including ALOS and landsat-7) by using object-oriented classifications combined with a decision tree and retrospective approaches. Also, land subsidence in Mentougou between 2006 and 2011 has been mapped using the interferometric synthetic aperture radar (InSAR) time-series analysis with the ALOS L-band SAR data. We processed 14 ascending SAR images during May 2006 to July 2011. Comparison of InSAR measurements with the land cover changes and pre-existing faults suggest that mining activities is the main cause of land subsidence. The land subsidence observed from InSAR data are approximately up to 15 mm/year in open-pit mining area and up to 24 mm/year in underground mining areas. The InSAR result are validated by the ground survey data in several areas, and the comparison between the InSAR result with the mining schedule showed there were some correlations between them. The result underline the potential use of InSAR measurements to provide better investigation for land subsidence, and also suggest that the most influential factors for land subsidence is underground coal mine.