Abstract:

An integrated approach (remote sensing, field, geodesy, geology, and hydrogeology) was conducted to assess and monitor land deformation and to identify the controlling factors was conducted over Riyadh city and its surroundings. Two settings were investigated. The first, Jinadriyah area (1.5 km²), an urban area located east of Riyadh city was selected to assess deformation associated with urbanization over desert lands. The second location, Al Kharj area (19,790 km²) to the south of Riyadh city, a reclaimed desert land that was selected to assess the deformation associated with groundwater extraction from fossil aquifers. My investigations revealed high subsidence rates (up to 30mm/yr) over Jinadriyah that could be related to mining of quarries, development of dump sites and fill areas, and defects in constructed roads and buildings or collapse of underlying sinkholes. Subsidence over Al Kharj area reaches up to 14mm/yr that is caused by excessive groundwater extraction from the fossil aquifers and the presence of compressible clays.