Newsletter of the Unesco Land Subsidence International Initiative

Vol.4 July 2020

Webinar

The University of Alicante (UA) and the Instituto Geológico y Minero de España (IGME) organized a webinar (in Spanish) in the framework of H2020 RESERVOIR project (Sustainable groundwater RESources managEment by integrating eaRth observation deriVed monitoring and flOw modelling Results (RESERVOIR)) entitled "Gestión sostenible de los recursos hídricos subterráneos integrando observaciones de la Tierra y modelos de flujo: el Alto Guadalentín". Several talks were focused on land subsidence. The webinar can be viewed on next link: https://vertice.cpd.ua.es/225186

Vacancies

The University of Sheffield has an opportunity in Geomechanical Inverse Modelling and Uncertainty Quantification:

https://civil.dept.shef.ac.uk/pgr/topics/3423.html

New Literature

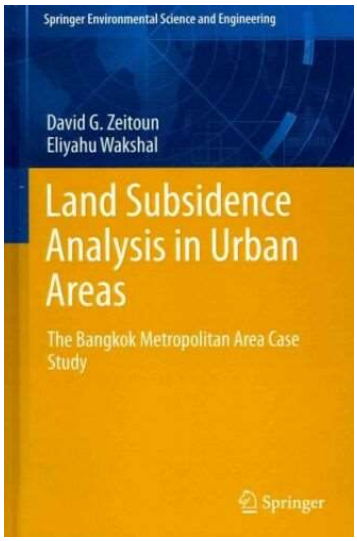
Book

David G. Zeitoun and Eliahu Wakshal: Land Subsidence Analysis in Urban Areas: the Bangkok Metropolitan Area case Study.

https://www.ebay.com/itm/Land-Subsidence-Analysis-in-Urban-Areas-The-Bangkok-Metropolitan-Area-Case-/353139169098

You can find a preview of a part of this book here:

https://books.google.nl/books?id=ZbRGAAAAQBAJ&printsec=copyright&redir_esc=y#v=onepage&q&f=false



General

Pietro contributed to following paper in Algorithma:

Zoccarato, C.; Gazzola, L.; Ferronato, M.; Teatini, P. Generalized Polynomial Chaos Expansion for Fast and Accurate Uncertainty Quantification in Geomechanical Modelling. *Algorithms* **2020**, *13*, 156.

https://www.mdpi.com/1999-4893/13/7/156?type=check_update&version=1

And, with our member Agnieszka as co-author and reviewed by several members of LaSII:

Guzy, A.; Malinowska, A.A. State of the Art and Recent Advancements in the Modelling of Land Subsidence Induced by Groundwater Withdrawal. *Water* **2020**, *12*, 2051.

https://www.mdpi.com/2073-4441/12/7/2051

Canada

Vancouver

Information about land subsidence (about 1 mm/yr) can be found in:

https://westvancouver.ca/sites/default/files/dwv/public-notices/2020/jul/20/2020%2007%2020%20NOTICE%20OF%20CONSIDERATION%20PACKAGE%2019-070%20%284369%20ERWIN%20DRIVE%29.pdf

India

Ganges Delta

Jarriel, T., Isikdogan, L.F., Bovik, A. *et al.* System wide channel network analysis reveals hotspots of morphological change in anthropogenically modified regions of the Ganges Delta. *Sci Rep* **10,** 12823 (2020). https://doi.org/10.1038/s41598-020-69688-3

Indonesia

Heri Andreas and Hassanuddin Abidin published following:

Heri Andreas *et al* 2020 *IOP Conf. Ser.: Earth Environ. Sci.* **500** 012036

Remote sensing capabilities on land subsidence, coastal water hazard and disaster studies.

https://iopscience.iop.org/article/10.1088/1755-1315/500/1/012036

Iran

Mashhad

In this city, a subsidence rate between 0.15 and 0.20 m/yr is detected by:

Khorrami, M., Abrishami, S., Maghsoudi, Y. *et al.* Extreme subsidence in a populated city (Mashhad) detected by PSInSAR considering groundwater withdrawal and geotechnical properties. *Sci Rep* **10,** 11357 (2020). https://doi.org/10.1038/s41598-020-67989-1

Iran

Neyshabur Plain

Mohsen Rezaei, Zahra Yazdani Noori & Majid Dashti Barmaki (2020) Land subsidence susceptibility mapping using Analytical Hierarchy Process (AHP) and Certain Factor (CF) models at Neyshabur plain, Iran, Geocarto
International, DOI: 10.1080/10106049.2020.1768596

Italy

Ravenna

Giambastiani, B.M.S.; Macciocca, V.R.; Molducci, M.; Antonellini, M. Factors Affecting Water Drainage Long-Time Series in the Salinized Low-Lying Coastal Area of Ravenna (Italy). *Water* **2020**, *12*, 256.

https://www.mdpi.com/2073-4441/12/1/256

https://www.mdpi.com/2073-4441/12/7/2051

PR China

Beijing

In: Remote Sensing:

Li Duan et al., An improved Multi-Sensor MTI Time-Series Fusion Method to Monitor the Subsidence of Beijing Subway Network During the Past 15 Years

Pietro is a co-author of following:

In: Engineering Geology: Lin Zhu et al., Effect of Water diversion Project on groundwater system and land subsidence in Beijing, China

https://www.sciencedirect.com/science/article/abs/pii/S0013795220301745

Tunesia

Tunis

This study shows that parts of Tunis are sinking because of groundwater extraction. Subsidence rates (in parts of the city) reach 14 – 19 mm/yr.

Anis Chaabani & Benoit Deffontaines (2020) Application of the SBAS-DInSAR technique for deformation monitoring in Tunis City and Mornag plain, Geomatics, Natural Hazards and Risk, 11:1, 1346-1377, DOI: 10.1080/19475705.2020.1788654

https://www.tandfonline.com/doi/full/10.1080/19475705.2020.1788654

United States

In a report of the Department of Commerce made an overview of tidal flooding events in the United States. The frequency of flooding events is increasing because sea-level rise and land subsidence: medium rates is 0.7 +/- 1.4 mm/yr, with a maximum of 7 mm/yr along the Louisiana southcoast.

https://tidesandcurrents.noaa.gov/publications/Techrpt_092_2019_State_of_US_High_Tide_Flooding_with_a_2020_Outlook_30June2020.pdf

California

Almost real -time information on groundwater levels, derived from the information of about 20.000 groundwater wells can be seen in following website of USGS

https://water.usgs.gov/ogw/highlights/2015-08-01.html

Vietnam

Mekong-Delta

In: Science of the total Environment:

Nguyen Van Khanh Triel et al., Future projections of flood dynamics in the Vietnamese Mekong Delta

https://www.sciencedirect.com/science/article/pii/S0048969720341188

Copernicus Mapping products on land subsidence in the Mekong Delta can be downloaded here:

https://emergency.copernicus.eu/mapping/download/171641/EMSN057_Final_Report.pdf?redirect=list-of-components/EMSN057

https://emergency.copernicus.eu/mapping/download/174707/EMSN062_Final_Report.pdf?redirect=list-of-components/EMSN062

From the Press

Indonesia

Good news from Indonesia: Progress on road map for addressing land subsidence:

https://climatecentre.org/news/1308/indonesian-red-cross-welcomes-progress-on-government-and-pfr-road-map-for-addressing-land-subsidence

Iran

Teheran

Water Quality Improves in Tehran's Southern Regions

The aim is to improve the quality of potable water in the southern regions of the vastly overcrowded capital and control land subsidence in the Varamin Plain

https://financialtribune.com/articles/energy/104304/water-quality-improves-in-tehran-s-southern-regions

Italy

The flood barrier to prevent Venice from flooding was tested:

https://earth.org/venice-tests-delayed-flood-barriers/

USA (and Chile)

California, San Joaquin Valley

NRDC Reports: California-Chile Water Nexus: Urban drought solutions.

https://www.nrdc.org/experts/amanda-maxwell/california-chile-water-nexus-1-urban-drought-solutions

North Fork Kings

North Fork Kings (California) joins a regional agreement to monitor land subsidence

https://northforkkings.org/

California

July 6, 2020 | Press Release

Today, **Rep. TJ Cox (CA-21)** announced the inclusion of several water infrastructure projects critical to the Central Valley in the House Energy and Water Development Appropriations bill, must pass legislation funding the Bureau of Reclamation, Western water projects, and other federal agencies for fiscal year 2021.

Today's appropriations legislation includes funding championed and secured by Rep. Cox for the following water projects:

- $200 million for the repair of critical Bureau of Reclamation canals, including the Friant-Kern Canal repairs and improvements;
- $25 million for repairs of critical Bureau of Reclamation canals to address the reduction in water storage and restore conveyance capacity due to land subsidence, including the Friant-Kern and Delta-Mendota Canals;
- $7.8 million for an expansion of the Los Vaqueros Reservoir;
- $3 million for subsidence correction for the Delta-Mendota Canal to address the reduction in storage in the San Luis Reservoir and the Mendota Pool; and
- $4 million for pre-construction of the Sites Reservoir Project to restore flexibility and adaptability to Central Valley Project and State Water Project operations.

Virginia

A radio fragment (5.05 minutes) about water management in Virginia:

https://www.vwrrc.vt.edu/wp-content/uploads/2020/07/vwr534Jul202020.mp3

A transcript can be found on:

http://www.virginiawaterradio.org/2020/07/episode-534-7-20-20-groundwater-issues.html

Webinars

Snappy, Interpretation of Sentinel-1 data

For those who want to process (free accessible) Sentinel-1 data themselves:

A one-and-half hour taking youtube instruction film how to use 'Snappy', a tool to process Sentinel-1 data, e.g. for interpretation of land subsidence. The instruction is followed by a second (one hour lasting) example of Mexico City

https://www.youtube.com/watch?v=PiU68g3WRIY

This is a RUS Copernicus training.

Indonesia

A one-hour lasting overview of Land Subsidence in Indonesia by Pulung Arya Pranantya.

(The sheets are in English)

Land Subsidence di Indonesia, bagaimana mendeteksi, dan mengatasinya, MGTI Talk 2020