United Nations Educational, Scientific and Cultural Organization

Intergovernmental Hydrological Programme

UNESCO Land Subsidence International Initiative

Newsletter of the Unesco Land Subsidence International Initiative

Vol. 17 August 2021

IPCC Report

Fact Sheet Asia:

https://www.ipcc.ch/report/ar6/wg1/downloads/factsheets/IPCC_AR6_WGI_Regional_Fact_Sheet_Asia.pdf

New Literature

Bangladesh

Abdullah-Al-Jabir et al., Correlation between temperature, sea level rise and land loss: an assessment along the Sundarbans coast,Journal of King Saud University - Engineering Sciences,2021,ISSN 1018-3639, https://doi.org/10.1016/j.jksues.2021.07.012.

(https://www.sciencedirect.com/science/article/pii/S1018363921001136)

Abstract: The geographical location of the Sundarbans, lying along the Bay of Bengal, makes it vulnerable to various natural features such as climate change, sea-level rise, reduction of fluvial input, increase of salinity, etc. Temperature around this region has been observed to be rising leading to an increase in the surface water temperature in the Bay of Bengal along the mangrove forest. As a result, the local sea-level also has been rising which has become a growing threat for this region and is expected to lead to permanent land losses either by inundation or by erosion. In this study, the extent of impacts due to temperature variations along the coastline of Sundarbans was assessed by establishing a correlation between temperature, local sea-level rise, and coastal land changes. Landsat images, spanning from 1989 to 2018 were analyzed to observe the net morphological changes along the coastline. Long-term temperature and tidal water level variations were used to check their trends and finally establish a correlation among them for better understanding.

Great Britain, Cheshire

Novellino, A., Bateson, L. & Jordan, C. Ground motion baseline analysis of the Cheshire UK GeoEnergy Observatory. Sci Rep 11, 15684 (2021). https://doi.org/10.1038/s41598-021-95191-4

India, Nicobar archipel

Prabakaran, N., et al. Mangrove recovery in the Nicobar archipelago after the 2004 tsunami and coastal subsidence. Reg Environ Change 21, 87 (2021). https://doi.org/10.1007/s10113-021-01811-0

India, Northwest Region

Pranshu Pranjal et al., Interpreting land subsidence impacts due to groundwater depletion using remote sensing-based GRACE gravity anomaly and DInSAR technique: a study on north-western parts of India

In: Environmental Earth Sciences, Ausgabe 17/2021

https://www.springerprofessional.de/interpreting-land-subsidence-impacts-due-to-groundwater-depletio/19593048

Indonesia, Bandung Basin

Gumilar I., Abidin H.Z., Andreas H., Sidiq T.P., Gamal M., Fukuda Y.

Land subsidence, groundwater extraction, and flooding in Bandung Basin (Indonesia)

https://www.lppm.itb.ac.id/2-s2-0-0035042361/

Indonesia, Jakarta

Riza Harmain et al 2021 IOP Conf. Ser.: Earth Environ. Sci. 716 012131:

Carrying capacity of transit-oriented development (TOD) area in Jakarta.

https://iopscience.iop.org/article/10.1088/1755-1315/716/1/012131/pdf

Within the IGCP framework: Roberta Boni et al., (e.g. Luigi Tosi, Pietro Teatini)

Sustainable development of coastal cities through control of land subsidence: activities of IGCP Project 663 in Jakarta

August 2021Episodes Follow journal

DOI: 10.18814/epiiugs/2021/021014

Project: IGCP 663 - Impact, Mechanism, Monitoring of Land Subsidence in Coastal Cities (IM2LSC)

https://www.researchgate.net/publication/353918497_Sustainable_development_of_coastal_cities_through_control_of_land_subsidence_activities_of_IGCP_Project_663_in_Jakarta

Iran, Fahlian Aquifer

Journal: Earth Science Informatics

Abouzar Nasiri et al., Spatial analysis of factors influencing land subsidence using the OLS Model (Case Study: Fahlian Aquifer)

https://www.springerprofessional.de/en/spatial-analysis-of-factors-influencing-land-subsidence-using-th/19587520

Italy, Campania

Di Paola, G. et al., Sea-level rise impact and future scenarios of inundation risk along the coastal plains in Campania (Italy). Environ Earth Sci 80, 608 (2021). https://doi.org/10.1007/s12665-021-09884-0

Italy, Rome

Gagliardi, V., Testing Sentinel-1 SAR Interferometry Data for Airport Runway Monitoring: A Geostatistical Analysis. Sensors 2021, 21, 5769. https://doi.org/10.3390/s21175769

https://www.mdpi.com/1424-8220/21/17/5769/htm

Italy, Sarno Plain

Valente, E. et al., Studying a Subsiding Urbanized Area from a Multidisciplinary Perspective: The

Inner Sector of the Sarno Plain (Southern Apennines, Italy). Remote

Sens. 2021, 13, 3323. https://doi.org/10.3390/rs13163323

https://www.mdpi.com/2072-4292/13/16/3323/pdf

Japan, Kanto Groundwater Basin

35th International Geological Congress Themes:

Groundwater basin management based on monitoring system -Groundwater level and land subsidence, Kanto Groundwater Basin in Japan - Mr. Kunio FURUNO T14.1 - Environmental Management of Water Resources

https://www.americangeosciences.org/information/igc/themes?field_igc_theme_value%255B0%255D=GEOSCIENCE%2520FOR%2520SOCIETY&order=field_igc_session&sort=asc&page=4

the Netherlands, Zegveld

J.J.H. van den Akker et al.,

EVALUATION OF 50 YEARS SUBSIDENCE MONITORING OF A PEAT MEADOW PARCEL TO COMPARE SEVERAL METHODS TO DETERMINE CO2-EMISSIONS

(Contribution to Eurosoil 2021)

https://www.postersessiononline.eu/173580348_eu/congresos/Eurosoil2021/aula/-PO_446_Eurosoil2021.pdf

PR China, General

Liu, F.; Kang, P.; Zhu, H.; Han, J.; Huang, Y. Analysis of Spatiotemporal Groundwater-Storage Variations in China from GRACE. Water 2021, 13, 2378. https://doi.org/10.3390/w13172378

https://www.mdpi.com/2073-4441/13/17/2378/htm

PR China, Beijing

Li, F. et al., Understanding the Influence of Building Loads on Surface Settlement: A Case Study in the Central Business District of Beijing Combining Multi-Source Data. Remote Sens. 2021, 13, 3063. https://doi.org/10.3390/rs13163063

Guo, L. et al., Mechanism of Land Subsidence Mutation in Beijing Plain under the Background of Urban Expansion. Remote Sens. 2021, 13, 3086. https://doi.org/10.3390/rs13163086

https://www.mdpi.com/2072-4292/13/16/3086/pdf

Li, H., Zhu, L., Dai, Z., Gong, H., Guo, T., Guo, G., Wang, J., and Teatini, P.: Spatiotemporal modeling of land subsidence using geographically weighted deep learning method based on PS-InSAR. Science of the Total Environment. 799. (2021) 149244 https://doi.org/10.1016/j.scitotenv.2021.149244

Xia, L. et al.,Precise Extraction of Buildings from High-Resolution Remote-Sensing Images Based on Semantic Edges and Segmentation. Remote Sens. 2021, 13, 3083. https://doi.org/10.3390/rs13163083

PR China, Shaanxi province

Yuan, M. et al., Subsidence Monitoring Base on SBAS-InSAR and Slope Stability Analysis Method for Damage Analysis in Mountainous Mining Subsidence Regions. Remote Sens. 2021, 13, 3107. https://doi.org/10.3390/rs13163107

PR China, Shanghai

Li, J.; Zhou, L.; Ren, C.; Liu, L.; Zhang, D.; Ma, J.; Shi, Y. Spatiotemporal Inversion and Mechanism Analysis of Surface Subsidence in Shanghai Area Based on Time-Series InSAR. Appl. Sci. 2021, 11, 7460. https://doi.org/10.3390/app11167460

Zhao, Q. et al., Integrated Analysis of the Combined Risk of Ground Subsidence, Sea Level Rise,and Natural Hazards in Coastal and Delta River Regions. Remote Sens.2021, 13, 3431. https://doi.org/10.3390/rs13173431

https://www.mdpi.com/2072-4292/13/17/3431/pdf

PR China, Wuhan

Xuguo Shi et al., Spatial and temporal subsidence characteristics in Wuhan (China),

during 2015–2019, inferred from Sentinel-1 synthetic aperture radar (SAR) interferometry

https://nhess.copernicus.org/articles/21/2285/2021/nhess-21-2285-2021.pdf

PR China, Yan'an District

Liao, M. et al., Subsidence Monitoring of Fill Area in Yan'an New District Based on Sentinel-1A Time Series Imagery. Remote Sens. 2021, 13, 3044. https://doi.org/10.3390/rs13153044

https://www.mdpi.com/2072-4292/13/15/3044/htm

Call for Papers

The Geological Society of America

2022 South-Central Section Meeting, 14–15 March 2022 McAllen, Texas, USA

Abstract deadline: 7 December 2021

T4. Hydrogeology and Water Resources II: Extreme Events and Coastal Hazards: Flooding, Contamination, and Land Subsidence

Dorina Murgulet, and Mohamed Ahmed.

Description: This session encourages submissions spanning a wide variety of disciplines related to the above topics. Scientific investigation of the impact of coastal hazards triggered by extreme weather events is essential for predicting and mitigating threats in coastal regions. Many coastal areas have experienced devastating flooding and infrastructure damage due to extreme storm events like hurricanes. Flooding and storm surges amplify the hazard of industrial sites and other above- and below-ground pollutants to nearby residents who consume water from local groundwater sources, presenting a high health risk to humans. In addition, land subsidence due to excessive fluid (groundwater, oil/gas) pumping or neotectonics presents extreme hazards to coastal regions.

https://www.geosociety.org/GSA/Events/Section_Meetings/GSA/Sections/sc/2022mtg/techprog.aspx

Remote Sensing, Special Issue

Deadline for manuscript submissions: 15 February 2022. This Special Issue invites manuscripts on the application of remote sensing for environmental management and planning as pertinent to applications to soil, plant, water, and air. We expect each paper to incorporate the current state of knowledge, summarize existing environmental issues and limitations, and provide new insights for future research and development in the field of environmental remote sensing. Topics for this Special Issue include but are not limited to:

Ecosystem assessment and monitoring

Land use/cover changes

Water resources assessment

Wetland and coastal dynamics

Geohazards and *land subsidence*

Time series analysis

New sensor/platform applications

Environmental and public health applications

Assessment of terrestrial ecosystems

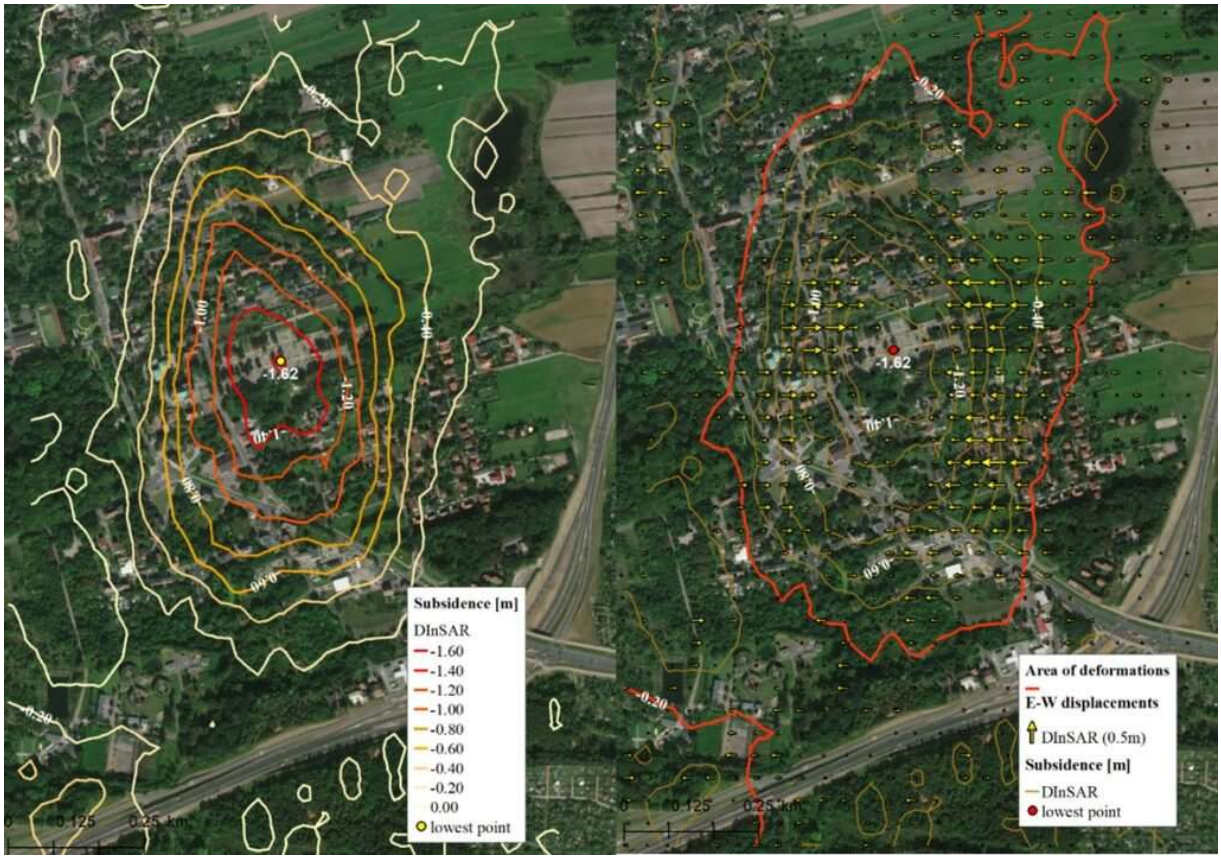
Biotic and abiotic plant stress

Precision agriculture

https://www.mdpi.com/journal/remotesensing/special_issues/environmental_planning_management

Mapping

Poland, Silesia



Broader monitoring of land subsidence in Silesia. Thanks to the data from the satellites

https://funnynews.xyz/broader-monitoring-of-land-subsidence-in-silesia-thanks-to-the-data-from-the-satellites/

Mining Activities

PR China, Jixi City

Yixin Zhang et al.,

Identifying the reuse directions of coal mining subsidence areas: A case study of Jixi City (China)†

https://doi.org/10.1002/ldr.4060

PR China, Shanxi province

Yuan, M. et al., Subsidence Monitoring Base on SBAS-InSAR and Slope Stability Analysis Method for Damage Analysis in Mountainous Mining Subsidence Regions. Remote Sens. 2021, 13, 3107. https://doi.org/10.3390/rs13163107

Cai, G. et al., On Site Monitoring for the Stability Evaluation of a Highway Tunnel above Goaves of Multi-Layer Coal Seams. Appl. Sci. 2021, 11, 7383. https://doi.org/10.3390/app11167383

Hu, X. et al., Unmanned aerial vehicle (UAV) remote sensing estimation of wheat chlorophyll in subsidence area of coal mine with high phreatic level. Earth Sci Inform (2021). https://doi.org/10.1007/s12145-021-00676-5

Liu, S.; Bai, J.; Wang, G.; Wang, X.; Wu, B. A Method of Backfill Mining Crossing the Interchange Bridge and Application of A Ground Subsidence Prediction Model. Minerals 2021, 11, 945. https://doi.org/10.3390/min11090945

https://www.mdpi.com/2075-163X/11/9/945

Modelling

Sun, Q. et al., Multi-scenario urban flood risk assessment by integrating future land use change models and hydrodynamic models, Nat. Hazards Earth Syst. Sci. Discuss. [preprint], https://doi.org/10.5194/nhess-2021-200, in review, 2021.

https://nhess.copernicus.org/preprints/nhess-2021-200/

Monitoring

Tripathi A., Tiwari R.K. (2021) Role of Space-Borne Remote Sensing Technology for Monitoring of Urban and Environmental Hazards. In: Rai P.K., Singh P., Mishra V.N. (eds) Recent Technologies for Disaster Management and Risk Reduction. Earth and Environmental Sciences Library. Springer, Cham. https://doi.org/10.1007/978-3-030-76116-5_18

Deha Agus Umarhadi et al.,

Use of multi-frequency (C-band and L-band) SAR data to monitor peat subsidence based on time-series SBAS InSAR technique

https://doi.org/10.1002/ldr.4061

From the Press

Italy, Venice

Floods hit Venice's St. Mark's Square

https://news.yahoo.com/floods-hit-venices-st-marks-095010344.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAAFUp9qnVB2ZlPTJKMvzqDpeTMvU53moqtYEU5fZQSTivKITvMDr_VnQSbDzIV60PP6YWgj7hcBe8h5m9Po_EUwGZbw5ji2B5oDrvRCzmmjVIKoiN1NU1DoYrROVSo0BId15qHjvVzeNkXFeNjB0EX75UWjxcMZOb8TvdxhFHUB9f

India, Ganges Delta

Study Provides a Better Estimate of Water-Level Rise in the Ganges Delta

https://floodlist.com/asia/study-water-level-rise-ganges-delta

Indonesia, Jakarta

Joe Biden expects Jakarta to sink within 10 years, this is the response of the deputy governor of DKI

https://digichat.info/2021/07/31/joe-biden-expects-jakarta-to-sink-within-10-years-this-is-the-response-of-the-deputy-governor-of-dki/

Indonesia, Semarang

FPIK UNDIP Professor Predicts that Semarang Will Sink in 50 Years from Now

https://fpik.undip.ac.id/v3/en/2021/08/04/fpik-undip-professor-predicts-that-semarang-will-sink-in-50-years-from-now/

Indonesia, Timbulsloko

Coastal Indonesian village adapts to life amid rising tidal floodwaters

https://news.mongabay.com/2021/08/coastal-indonesian-village-adapts-to-life-amid-rising-tidal-floodwaters/

Iran, Tehran

As water table lowers, Tehran and much of Iran are slowly sinking

https://www.bakersfield.com/ap/national/as-water-table-lowers-tehran-and-much-of-iran-are-slowly-sinking/article_15ed5f0b-4880-5ad7-b982-a8b43bdb8f5a.html

USA, California

The California Water Model: Resilience through Failure

https://californiawaterblog.com/2021/08/01/the-california-water-model-resilience-through-failure-2/

SAN JOAQUIN VALLEY SINKS IN DROUGHTS

https://www.mantecabulletin.com/news/local-news/san-joaquin-valley-sinks-droughts/

Projects

WWF DFCD seals groundbreaking partnership to reverse degradation of Mekong Delta.

https://www.wwf.or.th/?369235/WWF-DFCD-seals-groundbreaking-partnership-to-reverse-degradation-of-Mekong-Delta