Mustafa Kemal Emil

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Education:

2012 – 2021 **Ph.D. in Geological and Environmental Sciences,** Western Michigan University, Kalamazoo, Michigan, USA.
Ph.D. Dissertation: Use of InSAR Technologies for Countrywide Monitoring of Ground Deformation in Qatar and Identification of Controlling Factors

2007– 2011 **M.Sc. in Mining Engineering**, Middle East Technical University, Ankara, Turkey
M.Sc. Thesis: Land Degradation Assessment for an Abandoned Coal Mine with Geospatial Information Technologies

2001– 2007 **B.Sc. in Mining Engineering**, Middle East Technical University, Ankara, Turkey
Minor in Remote Sensing and Geographic Information Systems

Appointments:

2021– Present **Senior Research Associate**, Earth Sciences Remote Sensing Facility, Department of Geological and Environmental Sciences, Western Michigan University, Kalamazoo, Michigan, USA.

2016 – Present **Lab Manager**, Earth Sciences Remote Sensing Facility, Department of Geological and Environmental Sciences, Western Michigan University, Kalamazoo, Michigan, USA.

2012 – 2017 **Teaching and Research Assistant**, Department of Geological and Environmental Sciences, Western Michigan University, Kalamazoo, Michigan, USA.

2007 – 2011 **Teaching and Research Assistant**, Department of Mining Engineering, Middle East Technical University, Ankara, Turkey.

Current Support:

Sultan, M. (PI), **Emil, M. K. (Co-PI)**, EMIT for Lithologic Mapping, Mineral Exploration, and Tectonic Investigations in Arid Lands, (NASA, EMIT Science and Applications Team) (2024-2027; $ 518,282)

Sultan, M. (PI), **Emil, M. K. (Co-I)**, Nature, origin, and geohazards of active deformation in the Suez Rift, Egypt: Constraints from InSAR analysis and age dating, (NASA, ESI program) (2024-2027; $ 363,952)

Sultan, M., (PI), **Emil, M. K. (Co-I)**, Climatic and Anthropogenic Contributions to Hydrologic Systems in Arid Lands: GRACE-based Insights and Remedies (NASA, GRACE program)(2024-2028; $675,940)

Emil, M. K. (PI), Sultan M. (Co-PI), Automated Country-wide Monitoring System for Natural and Anthropogenic Ground Deformation and Establishing the general frame for an Early Warning System for Ground Deformation over Qatar (Qatar Ministry of Municipality and Environment) (2023-2025; $ 136,850)

Yellich J. (PI), **Emil, M. K. (Co-PI),** Sultan M. (Co-PI), Michigan Mine Waste Inventory for Critical Minerals: Priority I and III (USGS) (2023-2025; $ 54,000)

Sultan, M. (PI), **Emil, M. K. (Co-PI)**, Consultation Study for Sabkhas and Sand Dunes in the Mecca and Riyadh Provinces, Kingdom of Saudi Arabia (Saudi Geological Survey) (2023-2025; $ 441,806)

Sultan, M. (PI), **Emil, M. K. (Co-I)**, Consultancy Services and Technical Assistance for the Study of Release Mechanisms of Radionuclides in Groundwater Aquifers in KSA (Saudi Geological Survey) (2023-2025; $ 449,350)

Pending Support:

None at this time

Awards

2022	WMU All-University Graduate Research and Creative Scholar Award
2017	WMU Graduate College Research and Creative Scholar Award
2016	WMU Graduate College Student Travel Award
2016	WMU Research and Creative Activities Poster and Performance Day

Teaching Experience:

Dr. Emil worked as a teaching assistant at Western Michigan University (WMU) and Middle East Technical University (METU)

Sep. 2016 – Dec. 2016	GEOS-5600 Introduction to Geophysics **(WMU)**
Jan. 2015 – Apr. 2015	GEOS-5350 Geological and Environmental GIS **(WMU)**
Sep. 2015 – Dec. 2015	GEOS-1000-560 - Dynamic Earth **(WMU)**
Jan. 2014 – Apr. 2014	GEOS-5210 Geological & Envi. Remote Sensing (**WMU)**
Jan. 2013 – Apr. 2013	GEOS 4400 Petrology/ Petrography **(WMU)**
Sep. 2012 – Dec. 2012	GEOS 3350 Mineralogy **(WMU)**
Sep. 2008 – Dec. 2010	MinE 425 Mine Closure and Reclamation (**METU)**
Sep. 2008 – Dec. 2010	MinE 317 Rock Mechanics **(METU)**
Sep. 2008 – Dec. 2010	MinE 407 Mine Valuation **(METU)**

Feb. 2007 – Jun. 2007 MinE 332 Mine System Analysis (**METU)**
Feb. 2007 – Jun. 2007 MinE 417 Mine Ventilation **(METU)**

Dr. Emil developed and instructed the following short courses in the Earth Sciences Remote Sensing Facility at WMU;

May 2024 Training on InSAR time series analyses and Web-GIS automation for Qatar Ground Motion Service (QGMS), *Qatar Ministry of Municipality personnel*

Dec. 2019 Training on Hyperspectral Remote Sensing for Geological Mapping, Mineral Exploration and Target Detection in the Arabian Shield, *Saudi Geological Survey (SGS) personnel*

Jul. 2018 Assessment of the Spatial and Temporal Ground Deformation Patterns and Controlling Factors in Qatar: A Radar Interferometric Approach, *Qatar Ministry of Municipality & Environment (MME) personnel*

Sep. 2017 Investigation of Natural Groundwater Discharge Areas in Western Desert of Egypt, *National Authority for Remote Sensing & Space Sciences (NARSS) personnel*

Aug. 2014 Investigating Paleohydrology of Arabian Peninsula using Remote Sensing, *SGS*

Dec. 2014 Mapping Landslide Prone Areas by Extrapolating Fracture Plane Datasets in Faifa Mountain, Jazan, Saudi Arabia, *SGS personnel*

Training:

Aug. 2022 **InSAR Processing and Time-Series Analysis for Geophysical Applications: ISCE, ARIA-Tools, and MintPy,** UNAVCO

Jul. 2022 **GIPSYX training: Precise point positioning and subsequent analysis of GPS ground data,** JPL, NASA

Feb. 2018 **Advanced ENVI Spectral Analytics:** L3Harris Geospatial, Broomfield, Colorado, USA.

Fall 2013 **Remote Sensing and GIS Applications in Geological, Hydrological, and Environmental Studies:** Western Michigan University, Kalamazoo, Michigan, USA.

Sept. 2009 **International Training on ASD Spectroradiometer for Remote Sensing Applications,** İstanbul, Turkey

Sept. 2008 **International Summer School on Very High-Resolution Remote Sensing** GIPSA-lab - Grenoble Image sPeech Signal Automatics Laboratory, Grenoble, France

Research Interests:

Dr. Emil's research focuses on two main areas: InSAR time-series analysis and hyperspectral remote sensing. He uses InSAR and GPS observations to monitor ground deformation, examining the impacts of both anthropogenic and natural processes on ground motion. His dissertation focused on applying InSAR to study ground deformation in Qatar, and during his postdoctoral work at Western Michigan University, he developed an operational monitoring system for the country.

Dr. Emil is also deeply invested in the application of hyperspectral remote sensing. As part of the NASA EMIT Science and Applications Team project, he utilizes hyperspectral imagery for lithological mapping in the Arabian Nubian Shield, advancing mineral exploration, tectonic studies, and geological mapping in arid environments.

In addition to his work with InSAR and hyperspectral imaging, Dr. Emil is committed to understanding the effects of climate change on hydrology in arid regions. He combines noble gas thermometry, isotope geochemistry, and remote sensing techniques to investigate past wet climatic periods, particularly in regions like the Arabian Peninsula. His research also includes studying groundwater discharge processes in Egypt's Western Desert using multi-sensor satellite data.

Dr. Emil has also contributed to a variety of other research projects, including:

1. Assessing the age, origin, and sustainability of fossil aquifers in Saudi Arabia.
2. Conducting landslide hazard susceptibility mapping in the Jazan area of Saudi Arabia.
3. Evaluating subsidence and sea-level rise in Egypt's Nile Delta.
4. Monitoring mass wasting along Michigan's coastal bluffs.
5. Mapping mine waste sites in the Upper Peninsula of Michigan.

Technical and Field Experience:

Technical Experience:

He has experience in the following technical software:

1. Operating Systems: Windows 10, Windows Server 2016, and Linux Ubuntu 20.04
2. Programming: Python, IDL, Javascript
3. Radar Interferometry (InSAR): SARscape, SNAP, StaMPS, ISCE, and MintPY
4. GIS: ArcGIS Pro, and QGIS
5. Remote Sensing: ENVI, GDAL, and OTB
6. Exploration and 3D Mine Design: Micromine and Surpac
7. Statistical computing: R and SPSS
8. Web Development: WebApp Builder for ArcGIS (Developer Edition), Experience Builder

Field Experience:

Dr. Emil has conducted fieldwork using different equipment in various settings in Turkey, Saudi Arabia, and the USA. Examples include, but are not limited to:

1. Groundwater sampling for noble gas analysis for paleo-temperature reconstruction, Saudi Arabia
2. Topographical mapping using 3D ILRIS-HD Terrestrial Laser Scanner in an abandoned coal mine in Cankiri, Turkey
3. Surface water contamination investigation in an abandoned coal mine in Cankiri, Turkey
4. Geologic mapping using ASD FieldSpec spectroradiometer
5. Mining Engineering internship in Çayeli Copper Mine, Inmet Mining Company, Rize Turkey

6. Mining Engineering internship in Küre Copper Mine, Etibakır Enterprises, Kastamonu, Turkey

Languages:

1. Turkish (native language)
2. English

Professional Affiliations:

2012 – Present	American Geophysical Union (**AGU**).
2013 – Present	Geological Society of America (**GSA**).
2011 – Present	IEEE Geoscience and Remote Sensing Society (**GRSS**)
2007 – Present	Chamber of Mining Engineers of Turkey

Publications

Book Chapters:

1. Sultan, M., Ahmed, M., Wahr, J., Yan, E., **Emil, M.K**., 2014. Monitoring Aquifer Depletion from Space: Case Studies from the Saharan and Arabian Aquifers, in: Remote Sensing of the Terrestrial Water Cycle. Wiley Blackwell, pp. 347–366. https://doi.org/10.1002/9781118872086.ch21

Manuscripts in Preparation:

1. **Emil M. K.,** et al., Qatar Ground Motion Service: an Automated Country-wide Deformation Monitoring System based on Satellite Interferometry.
2. **Emil M. K.,** et al., Geochemical evidence from fossil aquifers of central Arabia for cooler environments during aquifer recharge.

Manuscripts:

1. Elhaddad, H., Sultan, M., Yan, E., Abdelmohsen, K., Mohammad, A. T., Badawy, A., Karimi, H., Saleh, H., **Emil, M. K.**, 2024, Optimization of floodwater redistribution from Lake Nasser could recharge Egypt's aquifers and mitigate its excessive floods. Commun Earth Environ 5, 385. https://doi.org/10.1038/s43247-024-01532-2
2. Abdelmohsen, K., Sultan, M., Yan, E., Abotalib, A, Save, H., **Emil, M. K.**, Elhaddad, H., Abdelmalik, K., 2024, Watching the Grand Ethiopian Renaissance Dam from a distance: Implications for sustainable water management of the Nile water, *PNAS Nexus*, Volume 3, Issue 7, https://doi.org/10.1093/pnasnexus/pgae219
3. Ahmad, S. M., Sadhasivam, N., Lisa, M., Lombardo, L., **Emil, M. K.**, Zaki, A., … Tanyas, H. (2023). Standing on the shoulder of a giant landslide: A six-year long

InSAR look at a slow-moving hillslope in the western Karakoram. Geomorphology, 108959. https://doi.org/10.1016/J.GEOMORPH.2023.108959

4. Sahour, H., Sultan, M., Abdellatif, B., **Emil, M.**, Abotalib, A.Z., Abdelmohsen, K., Vazifedan, M., Mohammad, A.T., Hassan, S.M., Metwalli, M.R., El Bastawesy, M., 2022, Identification of shallow groundwater in arid lands using multi-sensor remote sensing data and machine learning algorithms, J. Hydrology, v. 614, https://doi.org/10.1016/j.jhydrol.2022.128509
5. Sataer, G., Sultan, M., **Emil, M.K.**, Yellich, J.A., Palaseanu-Lovejoy, M.. Becker, R., Gebremichael, E., Abdelmohsen, K., 2022. Remote Sensing Application for Landslide Detection, Monitoring along Eastern Lake Michigan (Miami Park, MI). Remote Sensing. 14, 3474. https://doi.org/10.3390/rs14143474
6. Aljammaz, A., Sultan, M. Izadi, M. Abotalib, A.Z., Elhebiry, M.S., **Emil, M. K.**, Abdelmohsen, K., Saleh, M., and Becker, R., 2021, Subsidence induced by rapid urbanization in arid environments: A remote sensing–based investigation, Remote Sensing, 13, 1109, https://doi.org/10.3390/rs13061109
7. **Emil, M. K.**, Sultan, M., Alakhras, K., Sataer, G., Gozi, S., Al-Marri, M., & Gebremichael, E., **2021**. Countrywide monitoring of ground deformation using InSAR time series: A case study from Qatar. Remote Sensing, 13(4), 1–20. https://doi.org/10.3390/rs13040702
8. Elhebiry, M.S., Sultan, M., Kehew, A.E., Abu El-Leil, I., Bekiet,M.H., Soliman, N.M.A., Abdel Shahid, I., Soliman, N.M.A., Abotalib, A. Z., Emil, M.K., 2020, Paleozoic glaciation in NE Africa: field and remote sensing-based evidence from the South Eastern Desert of Egypt, International Geology Reviews, 62:9, 1187-1204, DOI: 10.1080/00206814.2019.1636416
9. Sultan, M., Sturchio, N.C., Alsefry, S., **Emil, M.K.**, Ahmed, M., Abdelmohsen, K., AbuAbdullah, M.M., Yan, E., Save, H., Alharbi, T., Othman, A., Chouinard, K., **2019**. Assessment of age, origin, and sustainability of fossil aquifers: A geochemical and remote sensing-based approach. J. Hydrol. 576, 325–341. https://doi.org/10.1016/j.jhydrol.2019.06.017
10. Karki, S., Sultan, M., Alsefry, S., Alharbi, H., **Emil, M.K.,** Elkadiri, R., Alfadail, E.A., **2019**. A remote-sensing-based intensity-duration threshold, Faifa Mountains, Saudi Arabia. Nat. Hazards Earth Syst. Sci. 19, 1235–1249. https://doi.org/10.5194/nhess-19-1235-2019
11. Abdelmohsen, K., Sultan, M., Ahmed, M., Save, H., Elkaliouby, B., **Emil, M. K.**, Yan, E., Abotalib, A.Z., Krishnamurthy, R. V., Abdelmalik, K., **2019**. Response of deep aquifers to climate variability. Sci. Total Environ. 677, 530–544. https://doi.org/10.1016/j.scitotenv.2019.04.316
12. Elhebiry, M.S., Sultan, M., Abu El-Leil, I., Kehew, A.E., Bekiet, M.H., Abdel Shahid, I., Soliman, N.M.A., Abotalib, A.Z., **Emil, M. K, 2019**. Paleozoic glaciation in NE Africa: field and remote sensing-based evidence from the South Eastern Desert of Egypt. Int. Geol. Rev. https://doi.org/10.1080/00206814.2019.1636416
13. Gebremichael, E., Sultan, M., Becker, R., El Bastawesy, M., Cherif, O., & **Emil, M. K.**, **2018**, Assessing land deformation and sea encroachment in the Nile Delta: A radar interferometric and inundation modeling approach. Journal of Geophysical Research: Solid Earth, v. 123, p. 3208–3224. https://doi.org/10.1002/2017JB015084

14. Alharbi, T., Sultan, M., Sefry, S., Elkadiri, R., Ahmed, M., Chase, R., Milewski, A., Abu Abdullah, M., **Emil, M.K.,** Chounaird, K., **2014**. An assessment of landslide susceptibility in the Faifa area, Saudi Arabia, using remote sensing and GIS techniques. Nat. Hazards Earth Syst. Sci. 14, 1553–1564. https://doi.org/10.5194/nhess-14-1553-2014
15. Demirel, N., Düzgün, Ş., **Emil, M.K.**, **2011**. Landuse change detection in a surface coal mine area using multi-temporal high-resolution satellite images. Int. J. Mining, Reclam. Environ. 25, 342–349. https://doi.org/10.1080/17480930.2011.608889
16. Demirel, N., **Emil, M.K.**, Duzgun, H.S., **2011**. Surface coal mine area monitoring using multi-temporal high-resolution satellite imagery. Int. J. Coal Geol. 86, 3–11. https://doi.org/10.1016/j.coal.2010.11.010
17. Yenilmez, F., Kuter, N., **Emil, M.K**., Aksoy, A., **2011**. Evaluation of pollution levels at an abandoned coal mine site in Turkey with the aid of GIS. Int. J. coal Geol. 86, 12–19. https://doi.org/10.1016/j.coal.2010.11.012

First Author Abstracts for Presentations (talks/posters) at Professional Meetings:

1. **Emil, M.K.,** Sultan, M., Algahtani, B., Alsefry, S., **2022**, Sinkhole formation in relation to nearby wastewater storage in abandoned quarries, southeastern Riyadh, Saudi Arabia, American Geophysical Union, Fall Meeting, Chicago, December 12-16.
2. **Emil, M.K.**, Pankratz, H.G., Sultan, M., **2021**, Rapid assessment of Surfside condo collapse using InSAR time series analysis and geospatial technologies, American Geophysical Union, Fall Meeting, New Orleans, December 13-17.
3. **Emil, M.K.**, Pankratz, H.G., Sultan, M., Al-Akhras, K., Abdelmohsen, K., Al-Marri, M., **2021**, Continuous monitoring of ground motion using Sentinel-1 InSAR time series: A case study from Doha, Qatar, American Geophysical Union, Fall Meeting, New Orleans, December 13-17.
4. **Emil, M. K.**, Sultan, M., Al-Akhras K, Sataer, G., Gozi S., and Shaw, N., **2019**, Continuous monitoring of ground deformation in Qatar, using Sentinel-1 InSAR time series. In American Geophysical Union, Fall Meeting, San Francisco, California. 9-13 December
5. **Emil, M. K.**, Sultan, M., Al-Akhras, K., Gebremichael, E., Izadi, M., & Karki, S. **2018**. Detecting and monitoring ground deformation using InSAR time series in arid environments; Doha City and its surroundings, Qatar. In American Geophysical Union, Fall Meeting. Washington, D.C. USA. 10-14 December.
6. **Emil, M.K.**, Sultan, M., Al-Harbi, Talal., Al-Bassam, A. M., Abuabdullah, M., Al-Sefry, S. **2018**. Geochemical evidences from fossil aquifers of central Arabia for cooler environments during aquifer recharge. In Geological Society of America, Annual Meeting. Indianapolis, Indiana, USA. 4-7 November
7. **Emil, M. K.**, Sultan, M., Abdellatif, B., Fathy, K., Sahour, H., Sataer, G., Karki, S., El Bastawesy, M., Metwaly, M. R. **2017**. Temporal Analysis of Multi-sensor Data to Identify and Monitor Natural Groundwater Discharge in Arid Environments. In

American Geophysical Union, Fall Meeting, New Orleans, Louisiana, USA. 11-15 December

8. **Emil, M.K.**, Sultan, M., Alharbi, T., Albassam, A.M., Chouinard, K., Abuabdullah, M.M., **2016**, Nature, timing, and origin of wet climatic periods in Arabia from geochemical (stable isotopes, noble gas thermometry, geochronology) and geomorphological data, AGU, San Francisco, California, December, 2016.
9. **Emil, M. K.,** Sultan, M., Abotalib, A.Z. Abouelmagd, A., Ahmed, M., **2015**, Timing and Nature of Wet Climatic Periods in North Africa and in the Arabian Peninsula: Inferences from Isotopic, Chronologic, and Remote sensing data. AGU, San Francisco, California, December, 2015.
10. **Emil, M. K,** Sultan, M., Ahmed, M., Chouniard, K., **2014**, Understanding the paleohydrological setting of the Arabian Peninsula: An integrated approach: AGU, San Francisco, CA, Dec. 2014.

Co-authored Abstracts for Presentations (talks/posters) at Professional Meetings:

2023

1. Karimi, H., Sultan, M., Abdelmohsen, K., **Emil, M. K.,** Yan, E., Saleh, H., Othman, A., 2023, Water Storage and Dynamics in Arid Region's Hydrologic Systems: Insights from GRACE and GRACE-FO TWS Solutions, American Geophysical Union, Fall Meeting, San Francisco, 10-15 December
2. Sultan, M., Abdelmohsen, K., Yan, E., Farag, A.Z.A., **Emil, M. K.,** Save, H., 2023, Monitoring GERD's Filling Process: A GRACE-Based Investigation, American Geophysical Union, Fall Meeting, San Francisco, 10-15 December
3. Sultan, M., Abdelmohsen, K., **Emil, M. K.,** Save, H., Yan, E., Farag, A.Z.A., 2023, GRACE and GRACE-FO for assessing watershed response to climate variability: insights from the Tigris Euphrates and the Nile basin watersheds, American Geophysical Union, Fall Meeting, San Francisco, 10-15 December
4. Shalifoe, M., **Emil, M. K.**, Yellich, J., Sultan, M.,, 2023, Identifying Abandoned Mine Surface Features Using Deep Learning, Upper Peninsula of Michigan, American Geophysical Union, Fall Meeting, San Francisco, 10-15 December
5. Saleh, H., Sultan, M., Abdelmohsen, K., Karimi, H., **Emil, M.K.**, Elhaddad, H., Assessing Groundwater Recharge from Tropical Cyclones in Southern Arabia, American Geophysical Union, Fall Meeting, San Francisco, 10-15 December

2022

6. Karimi, H., Sultan, M., **Emil, M. K.,** Sahour, H., Abdelmohsen, K., Saleh, H., 2022, The Impact of Extreme Precipitation Events on The Terrestrial Water Storage in The Arabian Peninsula, American Geophysical Union, Fall Meeting, Chicago, December 12-16.

7. Mohammad, A. T., Sultan, M., 3, Elhebiry, M. S., **Emil, M. K.**, Hassan, S., 2022, Did the late Miocene witness the failure of the Suez rift and the cessation of extension?, American Geophysical Union, Fall Meeting, Chicago, December 12-16.
8. Sataer, G., Sultan, M., **Emil, M.K.,** Palaseanu, M., Becker, R., Yellich, J. A., Gebremichael, E., Abdelmohsen, K., Karimi, H., 2022, Remote Sensing Applications for Landslide Detection and Monitoring along Lake Michigan Eastern Coastline, Miami Park, MICHIGAN, American Geophysical Union, Fall Meeting, Chicago, December 12-16.
9. Saleh, H., Sultan, M., Abdelmohsen, K., Save, H., Karimi, H., **Emil, M. K.,** 2022, Use of GRACE and GRACE-FO to Monitor the Impacts of Tropical Cyclones on Arabia's Hydrologic Systems, American Geophysical Union, Fall Meeting, Chicago, December 12-16.
10. Pankratz, H. G., Alharbi, H., Sultan M., Abdelmohsen K., **Emil, M. K.**, Alamudi, M., Alsadi, N., Alzahrani, S., Aldahri, M., Amri, R., 2022, InSAR, Geophysical, and Field Investigations to Assess and Monitor Deformation Associated with a Rising Salt Diapir, Jazan City and Surroundings, Kingdom of Saudi Arabia, American Geophysical Union, Fall Meeting, Chicago, December 12-16.

2021

11. Pankratz, H.G., Sultan,M., **Emil, M.K.**, Harbi, H.A., and Abdelmohsen, K., 2021, Salt Diapir Hazard Monitoring in the Southwestern Arabian Peninsula, American Geophysical Union, Fall Meeting, New Orleans, December 13-17.
12. Sahour, H., Sultan, M., **Emil, M.K.**, Abdellatif, B., Farag, A.Z.A., Vazifedan, M., Abdelmohsen, K., Hassan, S.M., and Attwa, M., 2021, Use of Multi-sensor Remote Sensing Data and Machine Learning to Locate Shallow Groundwater in the Western Desert of Egypt, American Geophysical Union, Fall Meeting, New Orleans, December 13-17.
13. Sataer, G., Sultan, M., **Emil, M.K.**, Palaseanu, M., Becker, R., Yellich, J.A., Pankratz, H.G., 2021, Continuous monitoring of Eastern Lake Michigan bluffs using Sentinel -1 and Unmanned Aerial Vehicles (UAVs) data, 2021, American Geophysical Union, Fall Meeting, New Orleans, December 13-17.

2020

14. Pankratz, H.G., Sultan,M., Abdelmohsen, K., Sauck, W.A., Al Sefry, S.A., Alharbi, H., **Emil, M.K.,** Gebremichael, E., Asaeidi, A., Alshehri, F., Hashim, H., Al-Shamrani, H.A., and El Sahly, 2020, Monitoring of Salt Diapir-Related Land Deformation in an Urban Setting, American Geophysical Union, Fall Meeting, San Francisco, 1-17 December
15. Sahour, H., Sultan, M., Vazifedan, M., **Emil, M.K.**, Farag, A.Z.A, Abdellatif, B., El Bastawesy, M., 2020, Use of machine learning algorithms and remote sensing data

to identify shallow groundwater occurrences in the Western Desert of Egypt, American Geophysical Union, Fall Meeting, San Francisco, 1-17 December

16. Sataer, G., Sultan, M., **Emil, M.K.**, Palaseanu, M., Becker, R., Yellich, J.A., 2020, Developing a Radar based Landslide Monitoring System (LMS) Along the Eastern Lake Michigan Bluffs, American Geophysical Fall Meeting, San Francisco, 1-17 December

2019

17. Shaw N., Sultan M., **Emil, M. K**., Yellich J., Becker., Palaseanu M., and Sataer G., 2019, Investigating groundwater seepage control on bluff failure along Michigan coastline using UAVs. In American Geophysical Union, Fall Meeting, San Francisco, California. 9-13 December
18. Hassan, S. R., Sultan, M., **Emil, M. K.**, Zahran, K.H., Issawy, E., Abdeldayem, A., Kamh, S., and Emam, E., 2019, Monitoring recent land subsidence in the Nile Delta of Egypt using Sentinel-1 InSAR time series. In American Geophysical Union, Fall Meeting. Washington, D.C. USA. 10-14 December.
19. Sataer, G.,1, Sultan, M., **Emil, M. K**., Palaseanu, M., Becker, R., Kehew, A., Yellich, J., and Kincare, K., 2019, Visualizing and Monitoring Bluff Retreat Using Sentinel 1 Radar Interferometry and UAV Imagery. In American Geophysical Union, Fall Meeting. Washington, D.C. USA. 10-14 December.
20. Pankratz H.G., Sultan, M., Sefry, S., Alharbi, H., **Emil M. K.**, and Gozi, S., 2019, Analyzing InSAR time series: Case study on salt diapir intrusions and sabkhas in Southwestern Saudi Arabia. In American Geophysical Union, Fall Meeting, San Francisco, California. 9-13 December
21. Sahour, H., Sultan, M., Yellich, J., Harrison, W., **Emil, M. K**., and Sataer, G., 2019, Use of Sentinel-1 and GRACE Data to Assess the Distribution, Nature, and Factors Causing Land Deformation in the Lower Peninsula of Michigan. In American Geophysical Union, Fall Meeting. Washington, D.C. USA. 10-14 December.
22. Sultan, M., Abdelmohsen, K., Elkaliouby, B., Abdellatif., B., **Emil, M. K**., Ahmed, M., Save, H., Farag, A., Al-Dousari, A., and Abdelmalik, K., 2019, Use of GRACE solutions for a better understanding of aquifer recharge sources, connectivity, groundwater flow, sustainability, and response to climate variability. In American Geophysical Union, Fall Meeting. Washington, D.C. USA. 10-14 December.

2018

23. Sultan, M., Abdelmohsen, K., **Emil, M. K.**, Elkaliouby, B., Save, H., Ahmed, M., & Abdelmalik, K. 2018. Fast Aquifer Response: GRACE, Geophysical, and Geochemical Evidence. In American Geophysical Union, Fall Meeting. Washington, D.C. USA. 10-14 December
24. Aljammaz, A., Sultan, M., **Emil, M. K.**, Alharbi, T., AlHarbi, H., & Alshehri, F. 2018. Using remote sensing and GIS technologies to map progressive urbanization and to identify hazardous areas related to sinkholes in Riyadh city and surroundings, Saudi Arabia. In American Geophysical Union, Fall Meeting. Washington, D.C. USA. 10-14 December

25. Sataer, G., Sultan, M., Gebremichael, E., **Emil, M. K.**, Kehew, A., Yellich, J. A., & Chase, R. 2018. Application of InSAR techniques for monitoring landslide and bluff recession along Lake Michigan's coastal bluff. In American Geophysical Union, Fall Meeting. Washington, D.C. USA. 10-14 December
26. Alshehri, F., Sultan, M., Alharbi, H., Alwagdani, E., **Emil, M. K.**, & Karki, S. 2018. Assessment of the Distribution and the Factors Controlling the Rise in Groundwater Levels in Mecca Region, Saudi Arabia. In American Geophysical Union, Fall Meeting. Washington, D.C. USA. 10-14 December
27. Gebremichael, E., Sultan, M., Al-Akhras, K., Saleh, A., Yellich, J. A., **Emil, M. K.**, & Karki, S. 2018. Detecting Sinkhole and Land Deformation Hazards Related to Carbonate Dissolution in Qatar using Geodetic Methods. In American Geophysical Union, Fall Meeting. Washington, D.C. USA. 10-14 December

2017

28. Fathy, K., Sultan, M., Ahmed, M., Save, H., **Emil, M. K.**, & Elkaliouby, B. 2017. Structural Control and Groundwater Flow in the Nubian Aquifer. In American Geophysical Union, Fall Meeting, New Orleans, Louisiana, USA. 11-15 December
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