forensic sciences

Communication

A Complementary Remote-Sensing Method to Find Persons Missing in Water: Two Case Studies

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Abstract: This short communication discusses how a specific geoarchaeological remote-sensing (RS) method, such as analyzing satellite images through NDWI (Normalized Difference Water Index), can be used to aid in searching and locating persons missing in watercourses. Thanks to its high capacity to analyze changes in the surface water area, this index can remotely detect the presence of anomalies related to disappearances in water bodies and provide valuable information that can reduce the use of human resources and help pinpoint likely areas of search. Two real-life cases of missing persons in rivers in which the NDWI index was used are presented, and the results obtained are discussed, emphasizing the importance of NDWI analysis as a complementary method to different approaches, especially non-invasive and remote-sensed ones, when positively searching for missing persons.

Keywords: remote sensing; NDWI; missing persons; Forensic Geoarchaeology

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1. Introduction

Due to the complex and multifaceted nature of forensic investigations, which often require one to operate across various nations, police and emergency services face the tremendous responsibility of effectively coordinating their search and rescue (SAR) efforts while ensuring that accurate and up-to-date information is disseminated to the appropriate parties in a timely manner, thereby minimizing the potential for errors, delays, or miscommunications that could impede their ability to respond swiftly and efficiently to emergencies and other critical situations [1].

In cases in which the implications of the investigations lead to a search for missing people who are alive or to a confirmation of their death, remote-sensing (RS) methods provide a territorial analysis using satellite images, not only to remotely enable an analysis of the territory of the disappearance but also to be able to highlight, through time-lapse images (i.e., before and after the disappearance), any changes in the territory through a series of multispectral filters, such as infrared, NDVI (Normalized Difference Vegetation Index, a vegetation growth index), NDWI (Normalized Difference Water Index, a water change index), or LiDAR, especially in wooded areas [2–6].

These computerized preliminary analyses are necessary when preparing to go to the site and considerably narrow the research field, favoring a more precise and focused autopsy investigation of the places. Therefore, using techniques ranging from macroscale to microscale, identifying all the peculiarities and information useful for research, reducing the use of human resources, possibly limiting intervention times, and enabling operations in difficult and/or dangerous conditions for rescue teams are all financially sustainable.

Combining such RS results with other geoarchaeological methods [7–12] within a simple GIS (Geographic Information System) platform is a safe method of collecting all this information and developing predictive models to find missing persons. Identifying patterns of spatial behavior is extremely important, as the information can be used by police forces to pinpoint likely areas of research [13].

Given the importance of effective search and rescue operations in cases of missing persons, it is imperative to explore all available methods and techniques that can assist in the location and recovery of these individuals. In light of this, the purpose of this short communication is to shed light on the potential of a specific remote-sensing (RS) approach, namely the Normalized Difference Water Index (NDWI), in aiding the search and location of missing persons, as evidenced by two recent and real-life case studies. As an RS index designed to evaluate water content in vegetation and water bodies, the NDWI has become a widely adopted tool for identifying and mapping such water bodies using remotely sensed data from diverse satellite sensors. By complementing other search methods, particularly those that are non-invasive and remote, the NDWI can contribute to the overall goal of locating and recovering missing persons, ideally alive but also, at times, deceased [14].

Initially introduced by McFeeters [15] as a remote-sensing (RS) index intended to evaluate water content in vegetation, the Normalized Difference Water Index (NDWI) was later modified by Gao [16] to enable the mapping of water bodies using data from the Landsat TM and ETM+ satellites. Specifically, the NDWI index is calculated by utilizing the near-infrared (NIR) and shortwave infrared (SWIR) spectral bands of satellite data.

As a result of its utility in water resource management, the NDWI index has gained widespread adoption in a range of applications, including but not limited to water quality assessment, hydrological modeling, and water-body mapping [17–19]. In particular, the NDWI index has proven to be an effective tool for identifying and monitoring changes in water bodies, such as lakes, rivers, and wetlands, as well as for assessing changes in water resources, such as fluctuations in water levels, changes in the surface water area, and variations in water quality [20–23].

In addition to these applications, the NDWI index has also been employed for monitoring changes in urban surface water bodies, which are critical for the ecosystem and climate, especially in the face of rapid urban development and associated urban runoff. Given the importance of these water bodies for water resource management and conservation, monitoring changes in urban surface water bodies using tools such as the NDWI index is vital [24,25].

Indeed, the ability of the NDWI index to assess water content in vegetation and water bodies has allowed it to become an indispensable tool for identifying and mapping water bodies, utilizing remotely sensed data from a range of satellite sensors. Its usefulness in assessing and monitoring variations in water bodies, such as lakes, rivers, and wetlands, as well as changes in water resources, including fluctuations in water levels, variations in water quality, and alterations in the surface water area, has made it an essential tool for water resource management.

Despite its widespread application in remote sensing (RS) for water resource management, environmental monitoring, and climate studies, the Normalized Difference Water Index (NDWI) is not typically employed in the search for missing persons, given its primary focus on the RS of surface water bodies [26,27]. However, the NDWI index's ability to detect changes in the surface water area has proven to be a defining and important element that can be utilized in the search for individuals who have disappeared in water bodies such as lakes or rivers, even if it is not traditionally used for this purpose. By leveraging the NDWI index's capacity for detecting changes in the surface water area, search and rescue operations can incorporate it as an additional tool to aid in locating missing individuals in water bodies. While this may not be the primary focus of its application, the NDWI index's potential for assisting in search and rescue efforts highlights its versatility and potential in a variety of settings.

2. Materials and Methods

This short communication will be based on NDWI applications in two real cases of missing persons, one in Italy immediately before the COVID-19 pandemic and the other in Great Britain, which caused quite a stir in the media.

2.1. Eleonora Salerno Case

On 13 January 2020, the search for Eleonora Salerno, also known as Dora, an 80-year-old woman who disappeared from her home in Santa Maria a Monte (Pisa, Italy), began. After days of intensive searching, no trace of the octogenarian was found, and no sightings were reported to the police. The woman had left her home on the afternoon of 13 January, wearing the same shoes she usually wore at home. The entire area near the apartment building where the pensioner lives was searched according to the provincial protocol decided by the prefecture, which is implemented whenever a person goes missing [28].

Numerous people, including firefighters, carabinieri, municipal police, civil protection, and Public Assistance, participated in the search. After a few days, the prefecture decided to interrupt the operations, which had also involved sniffer dogs that had picked up a trail lost on the banks of the Usciana Canal (a tributary of the region's main river, the Arno). The son of the elderly woman and the municipal administration of Santa Maria a Monte appealed to those who frequent waterways, such as fishermen, to report any useful information to the competent authorities to find the woman's body [29].

On 25 January, twelve days after her disappearance, an alarm was raised by a fisherman in the waters of the Arno near via della Botte, between Fornacette (Calcinaia, Pisa, Italy) and San Giovanni alla Vena (Vicopisano, Pisa, Italy). He had noticed a lifeless body in an advanced state of decomposition, later identified by authorities as that of the missing woman [30].

2.2. Nicola Bulley Case

A 45-year-old woman named Nicola Bulley from Lancashire in the North West of England disappeared on the morning of 27 January 2023 while walking her dog in St. Michael's on the Wyre. Her phone, still connected to a work's Teams call, was discovered on a bench near a public footpath by the Wyre River, with her unleashed and distressed dog nearby. CCTV and eyewitness reports indicated a period of approximately 25 min in which Nicola had gone missing [31].

The police immediately launched a missing person's investigation and deployed various resources, such as drones, helicopters, and search dogs, including the Bowland Pennine mountain rescue team, the North West underwater search team, and the Specialist Group International (SGI) diving team. Despite their efforts, no evidence was forthcoming for more than three weeks [32].

On 19 February 2023, police found a body during the search for Nicola Bulley, following a tip-off from walkers. Her body was discovered in reeds in a bend of the river, approximately one mile downstream from where her phone was found. Using dental records, the police confirmed it was Nicola. The case received intense international media and social media attention for three weeks due to its unusual circumstances [33–35].

2.3. NDWI

For the NDWI analysis, in both cases, multispectral satellite images were collected four days after the disappearances, with a maximum cloud cover of less than 14%. For the Italian case, on 17 January 2020, at 09:50 (UTC) a PS2 satellite image (PlanetScope Dove with red, green, blue, and near-infrared channels) was selected. For the UK case, on 30 January 2023, at 10:53 (UTC) a PSB-SD satellite image (PlanetScope SuperDove with red, green, blue, near-infrared channels, as well as a new red-edge, green I, coastal-blue, and yellow channels) was selected.

To ensure uniformity in the spectral response across different atmospheric conditions and locations and to reduce uncertainty, assets undergo orthorectification, calibration, and radiometric correction. Additionally, multispectral products are corrected for sensor anomalies and terrain distortions. This satellite imagery has a 3-m resolution optimized for data science and analytic applications, which demand precise geolocation for temporal analysis, monitoring, and cartographic projection [36].

Using the NDWI calculated according to (1), the aim is not only to highlight possible evidence of changes in the surface water area but also to detect possible "non-water" anomalies in both the Arno and Wyre rivers.

$$NDWI = \frac{Green - NiR}{Green + NiR} \quad (1)$$

3. Results and Discussion

In this section, the results extracted from the NDWI analysis in both cases will be highlighted. They will show a series of point anomalies linked to specific NDWI values. In the Italian case, the analysis occurred during the search period for the missing person, contributing to her recovery, while in the UK case, this analysis was subsequent to the recovery of the body.

3.1. Eleonora Salerno

The satellite image four days after the disappearance report shows the search area for Ms. Eleonora Salerno at the confluence of the Usciana Canal and the Arno River. In Figure 1, you can see the position where the man-trailing search dogs sniffed the missing person 24 h away up to the banks of the Usciana Canal, where the trail was lost.

Figure 1. In the figure, it is possible to see the presence of the Arno River crossing the Tuscan territory in an east-west direction. The yellow asterisk indicates the last scent trail detected by search dogs along the Usciana Canal, which flows into the Arno river just a little further to the west.

Using this image, an NDWI analysis was conducted, which highlighted not only water consistency but also changes within the water basins (Figure 2). The value scale shows positive and negative values. The former is associated with a strong presence of water, while the latter is linked to significant variations in water content or the presence of non-water elements within water basins. By querying the GIS system, these latter values were precisely sought within the regions delimited by the Usciana Canal and the Arno River from the confluence.

Figure 3 clearly shows the presence of four distinct points where these values are negative instead of being positive, as normally expected within a watercourse, thus highlighting anomalies that had to be carefully considered in the search area.

Given the nature of a human body and the various dynamics within a river or canal, which can come into play (such as different depths, tributaries, sediments, weather events, rapids, dams, entanglements, etc.), it was difficult to determine beforehand the traveling speed of the body. For this reason, and thanks to the limited number of anomalies, checking each point identified by the NDWI analysis was suggested in order to leave nothing to chance.

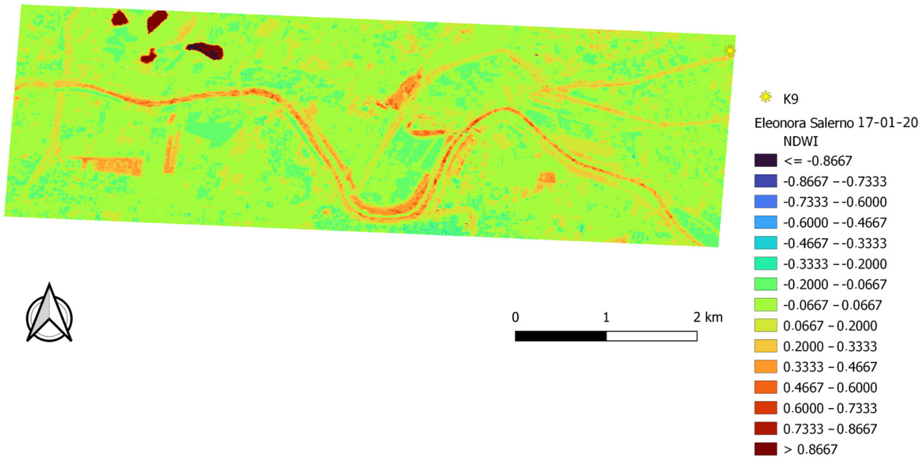

Figure 2. The figure shows the result following the application of the NDWI. Note the negative values, which are important for determining the presence of anomalies in the water bodies.

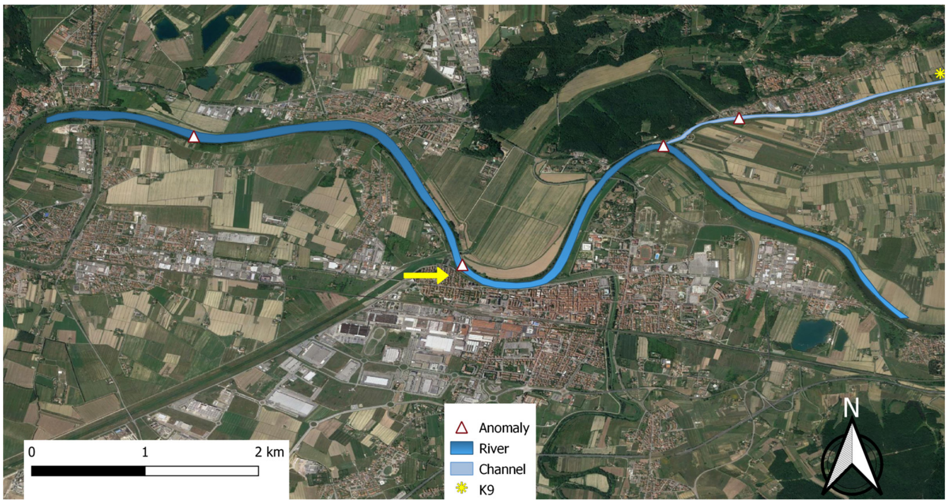

Figure 3. The figure highlights the anomalies (white triangles) identified following the NDWI analysis. The four anomalies were found both inside the canal (light blue) and within the river (dark blue). It is worth noting that the body was found in the area highlighted by the second triangle from the left (see the arrow).

The result was, in fact, the recovery of the body stranded in the area identified by one of the points (Figure 3) [29]. For completeness of information, in addition to the point where the body was found, only one other point was previously checked, highlighting the presence of a surfboard, which was also stranded.

3.2. Nicola Bulley

As in the Italian case, the satellite image four days after the report of the disappearance clearly shows the search area for Nicola Bulley along the Wyre River. Figure 4 highlights the meandering course of the river.

Using this image, the NDWI analysis was performed, which in this case also highlighted not only water consistency but also changes within the water basins (Figure 5). The value scale reports both positive values indicating a high presence of water and negative values linked to significant variations in water content or the presence of non-water elements within water basins. In this case as well, the focus was on searching for negative values within the river course of the Wyre River by querying the GIS system.

Figure 4. In the figure, it is possible to appreciate the meandering course of the Wyre River.

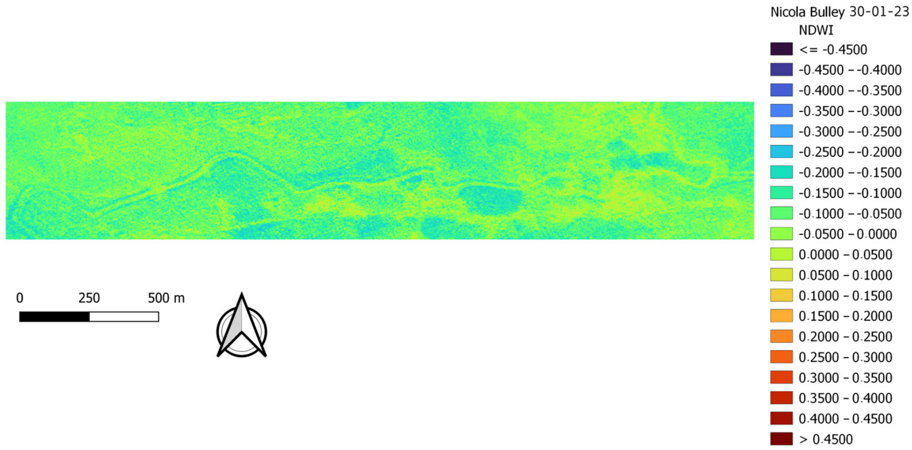

Figure 5. The figure shows the NDWI analysis, in which it is possible to highlight the negative values indicating anomalies by querying the GIS system.

Figure 6 clearly shows the presence of six distinct negative points, indicating anomalies to be investigated. As with the Italian case, due to a series of variables, such as meandering, sediments, depth, precipitation, etc., it appears difficult to calculate in advance the travel speed of the body during the search. For this reason, during the search, prioritizing and specifically checking this limited number of anomalies identified by the NDWI analysis would have been necessary before embarking on a massive and time-consuming seabed scan. Based on the location of the stranded body's discovery, the result appears consistent with the area identified by one of the points (Figure 6) [31].

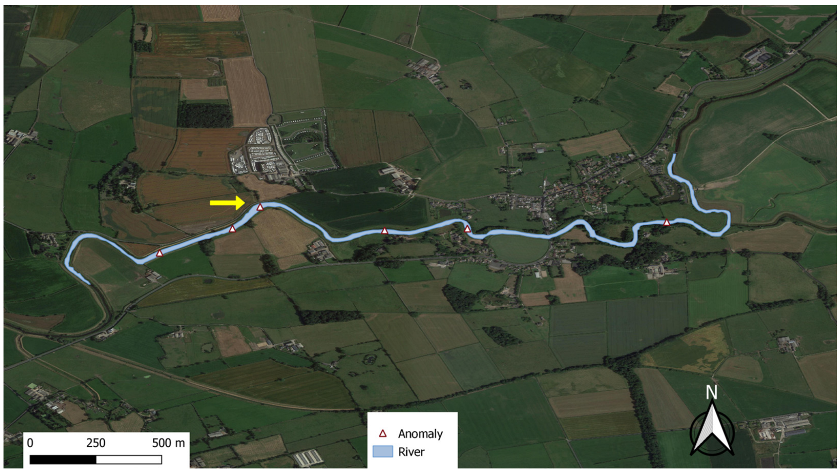

Figure 6. The figure highlights the anomalies (white triangles) identified following the NDWI analysis. The six anomalies were found within the river (blue). It is worth noting that the body was found in the area highlighted by the third triangle from the left (see the arrow).

4. Discussion

Thanks to the results obtained in these two real cases of searching for missing persons, it is evident how NDWI analysis can play a primary and complementary role to other methodologies used in the context of search and rescue (SAR) operations. Within a logic of moving from the macroscale to the microscale within non-invasive investigations, this analysis fits well between searches for locus operandi [8,13] and vegetative variations (i.e., NDVI [5,11]) and on-site searches using ground-penetrating radar [7,37].

One of the most significant benefits of NDWI is that it is a non-destructive method of remote sensing. This means that it does not require direct contact with the target area, and it does not cause any physical damage. Another strength of NDWI is its high accuracy in detecting anomalies within water bodies. This method has been successfully used in many non-forensic applications, such as flood monitoring, drought detection, and water quality analysis. Additionally, NDWI can detect small changes in water content, such as changes in surface water bodies, making it a very effective tool for monitoring and analyzing non-water anomalies such as anything that is not pertinent or made by water (including corpses or body parts). Lastly, NDWI is a relatively low-cost method of remote sensing and does not require expensive equipment.

However, there are also some weaknesses to consider when using NDWI. Firstly, it is important to note that NDWI can be influenced by weather conditions, such as cloud cover, rain, or snow, which may affect the accuracy of the analysis. Furthermore, NDWI can detect non-water elements that are simple abandoned objects inside the analyzed watercourse, which are not related to a missing person. Furthermore, NDWI requires data processing and analysis, which may require specialized software and technical expertise to accurately interpret results. Lastly, NDWI may have a limited spatial or temporal resolution, depending on the source of the data used and the method of analysis.

Accordingly, while NDWI has many strengths that make it an invaluable tool for remote sensing, it is important to also consider its weaknesses when using it. By understanding both the benefits and limitations of NDWI, it is possible to make informed decisions and utilize this technology to its full potential during SAR operations.

5. Conclusions

This short communication emphasizes the importance of using the NDWI index, a specific remote-sensing (RS) method, when searching for missing persons in watercourses. By analyzing satellite images, this index can detect the presence of anomalies related to disappearances in water bodies and provide valuable information that can reduce the use of human resources and help pinpoint likely areas of search. This method has been successfully applied in two real-life cases of missing persons in rivers. Specifically, two recent cases, one in 2020 and one in 2023 (the latter particularly covered by the media), saw the use of this specific RS analysis. It is suggested that the NDWI index can complement other approaches, especially non-invasive and remote-sensed ones, when positively searching for missing persons. Through the analysis of water basins in which people disappeared, highlighting changes consistent with the presence of non-water elements, this NDWI index's ability is a defining and important element that can be used to search for people disappearing in water bodies such as lakes or rivers. Finally, the integration of different RS results with other geoarchaeological methods in a GIS platform can develop predictive models to find missing persons and pinpoint likely areas of research.

In a more general perspective of searching for missing persons and SAR operations, NDWI analysis could play a fundamental and complementary role to other well-known approaches. Given its non-destructive and remote nature, it allows not only for a versatile approach to every situation that needs a greater focus on a search area along watercourses but also an optimization of both the timing and the personnel involved, which, for this type of investigation, does not necessarily need to be deployed in the field.

Currently, the use of the NDWI index in searching for missing persons in watercourses is quite promising. As technology advances, remote-sensing methods will become increasingly sophisticated, allowing for more precise and accurate analyses. This means that the NDWI index may become even more effective in detecting anomalies related to disappearances in water bodies, reducing the need for human resources and improving the chances of locating missing persons. When evaluating the strengths and weaknesses of such a complementary method, the great potential of non-destructive RS is clear within the geoarchaeological context of searching for missing persons in watercourses.

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References

1. Morewitz, S.J.; Colls, C.S. *Handbook of Missing Persons*; Springer: Cham, Switzerland, 2016; ISBN 978-3-319-40199-7.
2. Ruffell, A.; Mckinley, J.; Donnelly, L.; Harrison, M.; Keaney, A. *Geoforensics*, 1st ed.; John Wiley & Sons Inc.: Chichester, UK; Hoboken, NJ, USA, 2008; ISBN 978-0-470-05735-3.
3. Donnelly, L.J.; Pirrie, D.; Harrison, M.; Ruffell, A.; Dawson, L.A. *The Geological Society of London—A Guide to Forensic Geology*; GSL Miscellaneous Titles; GSL: London, UK, 2021; ISBN 978-1-78620-488-2.
4. McKinley, J.; Ruffell, A.; Harrison, M.; Meier-Augenstein, W.; Kemp, H.; Graham, C.; Barry, L. Spatial Thinking in Search Methodology: A Case Study of the 'No Body Murder Enquiry', West of Ireland. In *Criminal and Environmental Soil Forensics*; Ritz, K., Dawson, L., Miller, D., Eds.; Springer: Dordrecht, The Netherlands, 2009; pp. 285–302. ISBN 978-1-4020-9204-6.
5. Rocke, B.; Ruffell, A. Detection of Single Burials Using Multispectral Drone Data: Three Case Studies. *Forensic Sci.* **2022**, *2*, 72–87. [CrossRef]
6. Barone, P.M.; Groen, W.J.M. *Multidisciplinary Approaches to Forensic Archaeology: Topics Discussed during the European Meetings on Forensic Archaeology (EMFA)*; Springer: Berlin/Heidelberg, Germany, 2018; ISBN 978-3-319-94397-8.
7. Barone, P.M.; Di Maggio, R.M. Forensic Geophysics: Ground Penetrating Radar (GPR) Techniques and Missing Persons Investigations. *Forensic Sci. Res.* **2019**, *4*, 337–340. [CrossRef] [PubMed]
8. Barone, P.M.; Di Maggio, R.M.; Mesturini, S. Forensic Geoarchaeology in the Search for Missing Persons. *Forensic Sci.* **2021**, *1*, 8–15. [CrossRef]
9. Pensieri, M.G.; Garau, M.; Barone, P.M. Drones as an Integral Part of Remote Sensing Technologies to Help Missing People. *Drones* **2020**, *4*, 15. [CrossRef]
10. Rocke, B.; Ruffell, A.; Donnelly, L. Drone Aerial Imagery for the Simulation of a Neonate Burial Based on the Geoforensic Search Strategy (GSS). *J. Forensic Sci.* **2021**, *66*, 1506–1519. [CrossRef]
11. Molina, C.M.; Castellanos, D.; Baena, A.; Salgado, A.; Pringle, J. Forced Disappearances and Missing People in Colombia, South America. *Forensic Sci. Int. Rep.* **2022**, *6*, 100287. [CrossRef]
12. Barone, P.M.; Matsentidi, D.; Mollard, A.; Kulengowska, N.; Mistry, M. Mapping Decomposition: A Preliminary Study of Non-Destructive Detection of Simulated Body Fluids in the Shallow Subsurface. *Forensic Sci.* **2022**, *2*, 620–634. [CrossRef]
13. Barone, P.M.; Di Maggio, R.M.; Mesturini, S. Materials for the Study of the Locus Operandi in the Search for Missing Persons in Italy. *Forensic Sci. Res.* **2022**, *7*, 371–377. [CrossRef]
14. Oyler, L.; Smith, R.; Campbell, C.S.; Hansen, N.; Hopkins, B.; Svedin, J.; Woolley, A. Remote Sensing of Sub-Field Water Stress Using NDWI, ET and SAR Data. In Proceedings of the American Geophysical Union, Fall Meeting 2019, San Francisco, CA, USA, 9–13 December 2019. B31N-2403.
15. Mcfeeters, S.K. The Use of the Normalized Difference Water Index (NDWI) in the Delineation of Open Water Features. *Int. J. Remote Sens.* **1996**, *17*, 1425–1432. [CrossRef]
16. Gao, B. NDWI—A Normalized Difference Water Index for Remote Sensing of Vegetation Liquid Water from Space. *Remote Sens. Environ.* **1996**, *58*, 257–266. [CrossRef]
17. El Kafrawy, S.B.; Donia, N.S.; Mohamed, A.M. Water Quality Assessment Based on CWQI and NDWI Indices in Mariout Lake, Egypt. *MOJ Ecol. Environ. Sci.* **2017**, *2*, 224–232. [CrossRef]

18. Campos, J.C.; Sillero, N.; Brito, J.C. Normalized Difference Water Indexes Have Dissimilar Performances in Detecting Seasonal and Permanent Water in the Sahara–Sahel Transition Zone. *J. Hydrol.* **2012**, *464–465*, 438–446. [CrossRef]
19. Serrano, J.; Shahidian, S.; Marques da Silva, J. Evaluation of Normalized Difference Water Index as a Tool for Monitoring Pasture Seasonal and Inter-Annual Variability in a Mediterranean Agro-Silvo-Pastoral System. *Water* **2019**, *11*, 62. [CrossRef]
20. Yan, D.; Wang, X.; Zhu, X.; Huang, C.; Li, W. Analysis of the Use of NDWIgreen and NDWIred for Inland Water Mapping in the Yellow River Basin Using Landsat-8 OLI Imagery. *Remote Sens. Lett.* **2017**, *8*, 996–1005. [CrossRef]
21. Elhag, M.; Gitas, I.; Othman, A.; Bahrawi, J. Effect of Water Surface Area on the Remotely Sensed Water Quality Parameters of Baysh Dam Lake, Saudi Arabia. *Hydrol. Earth Syst. Sci. Discuss.* **2019**, 1–20. [CrossRef]
22. De Alwis, D.A.; Easton, Z.M.; Dahlke, H.E.; Philpot, W.D.; Steenhuis, T.S. Unsupervised Classification of Saturated Areas Using a Time Series of Remotely Sensed Images. *Hydrol. Earth Syst. Sci.* **2007**, *11*, 1609–1620. [CrossRef]
23. Titolo, A. Use of Time-Series NDWI to Monitor Emerging Archaeological Sites: Case Studies from Iraqi Artificial Reservoirs. *Remote Sens.* **2021**, *13*, 786. [CrossRef]
24. Ali, M.; Dirawan, G.; Hasim, A.; Abidin, M. Detection of Changes in Surface Water Bodies Urban Area with NDWI and MNDWI Methods. *Int. J. Adv. Sci. Eng. Inf. Technol.* **2019**, *9*, 946. [CrossRef]
25. Guha, S.; Govil, H.; Taloor, A.K.; Gill, N.; Dey, A. Land Surface Temperature and Spectral Indices: A Seasonal Study of Raipur City. *Geod. Geodyn.* **2022**, *13*, 72–82. [CrossRef]
26. Rokni, K.; Ahmad, A.; Solaimani, K.; Hazini, S. A New Approach for Detection of Surface Water Changes Based on Principal Component Analysis of Multitemporal Normalized Difference Water Index. *J. Coast. Res.* **2016**, *318*, 443–451. [CrossRef]
27. Șerban, C.; Maftei, C.; Dobrică, G. Surface Water Change Detection via Water Indices and Predictive Modeling Using Remote Sensing Imagery: A Case Study of Nuntasi-Tuzla Lake, Romania. *Water* **2022**, *14*, 556. [CrossRef]
28. Emergenza24 Ricerche Concluse di Scomparsi. Available online: https://www.emergenza24.org/ricerche-concluse-di-scomparsi/ (accessed on 20 March 2023).
29. Artiaco, Ida Pisa, Cadavere di Donna Riaffiora dalle Acque Dell'arno: È di Eleonora Salerno. Available online: https://www.fanpage.it/attualita/giallo-a-pisa-cadavere-di-donna-riaffiora-dalle-acque-dellarno-non-sappiamo-chi-sia/ (accessed on 20 March 2023).
30. Pace, Enrico Cadavere in Arno, è Quello di Dora. Lo Riconoscono i Familiari. Available online: https://www.ilcuoioindiretta.it/cronaca/2020/01/25/cadavere-in-arno-e-quello-di-dora-lo-riconoscono-i-familiari/71745/ (accessed on 1 March 2023).
31. Mata, William Timeline of Nicola Bulley Disappearance as Body Found in Search for Missing Woman. Available online: https://www.independent.co.uk/news/uk/home-news/nicola-bulley-missing-timeline-body-found-b2285571.html (accessed on 1 March 2023).
32. Solomons, Adam Extra Divers Search for Nicola Bulley. Available online: https://www.lbc.co.uk/news/nicola-bulley-pictures-cctv-before-disappearance-missing-mum-police-search/ (accessed on 20 March 2023).
33. Haigh, E. Body Found by Police in Hunt for Nicola Bulley after Tip from Walkers. Available online: https://www.dailymail.co.uk/news/article-11769017/Police-hunting-Nicola-Bulley-body-river-mile-went-missing.html (accessed on 20 March 2023).
34. Falcioni, Davide Nicola, Scomparsa nel Nulla: Dopo 3 Settimane la Svolta delle Indagini, Trovato Cadavere nel Fiume. Available online: https://www.fanpage.it/esteri/nicola-scomparsa-nel-nulla-dopo-3-settimane-la-svolta-delle-indagini-trovato-cadavere-nel-fiume/ (accessed on 20 March 2023).
35. Gerard, L. Villains of Nicola Bulley Media Coverage Were on Social Media, but Press Has Lessons to Learn. *Press Gazette*, 2 February 2023.
36. Chen, Q.; Kutser, T.; Collin, A.; Warner, T.A. *Fine Resolution Remote Sensing of Species in Terrestrial and Coastal Ecosystems*; Routledge: London, UK, 2021; ISBN 978-1-00-043620-4.
37. Pringle, J.K.; Stimpson, I.G.; Wisniewski, K.D.; Heaton, V.; Davenward, B.; Mirosch, N.; Spencer, F.; Jervis, J.R. Geophysical Monitoring of Simulated Clandestine Burials of Murder Victims to Aid Forensic Investigators. *Geol. Today* **2021**, *37*, 63–65. [CrossRef]