

10th Annual UN-SPIDER Conference

Space tools to assist water and sanitation services in disaster and emergency management

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Content

- DRM Cycle
- Potential applications of drones and satellites
- Project OVERCOME
- Final Considerations



Disaster Risk Management Cycle

Source: Humanitarian Action, Response and Relief, Coventry University https://www.futurelearn.com/courses/humanitarian-action-response-relief/0/steps/60986

Drones and Satellites in Provision of Water

- Locate water boreholes/handpumps/pipes that are operational or damaged
- Deliver spare parts to repair pumps/pipes
- Identify areas where portable tanks to supply drinking water can be installed
- Monitor surface water and groundwater storage
- Monitor water sources for quality



Images: https://www.pnas.org/content/115/15/3731



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Water starts flowing from a pump at an accommodation centre in Mozambique for people displaced by Cyclone Idai.

Monitoring algae blooms



Figure 1. Harmful algal bloom (HAB) in Lake Erie, USA on October 9, 2011 as recorded by Moderate Resolution Imaging Spectroradiometer (MODIS) on the Aqua satellite **(Left)** (courtesy NASA). Technologies with unmanned systems in the water (center panel) and air **(Right)** have the potential to be used to monitor HABs *in situ*. The unmanned systems shown here were tuned to a released fluorescein dye, which has been used a surrogate for HABs (Powers et al., 2018a) (courtesy D. Schmale).

Source: Schamale III et al. 2019, Front. Bioeng. Biotechnol.

Drones and Satellites in Provision of Sanitation

- Identify excreta disposal facilities that are operational or damaged
- Identify existing urban sewer systems to serve as temporary latrines
- Identify wastewater treatment plants that have been affected



Images: https://www.pnas.org/content/115/15/3731



- Identify locations for WWTP and toilets in camps
- Identify potential illegal FS discharges in risky area
- Deliver packet latrines



Image: Softbox and AT&T's Skypod and drone. Credit: AT&T.



Image: https://www.dezeen.com/2009/03/16/peepoo-bag-by

Drones and Satellites in Stormwater Management

Monitor stormwater systems

• Topographical surveys

• Identify potential blockages



Image: Nima Gutter in Ghana, https://ugdcs2014.wordpress.com/2015/03/16/nima-gutter-ablessing-or-a-curse/

Image: The Myanmar Times/U Khine Zaw Lin





digital innOVation in climatE hazaRd early warning and related disease prevention for COMmunity capacity building and rEsilience



UKRI GCRF DIDA OVERCOME

OVERCOME Consortium

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UNIVERSITY OF

The Career University

Public Health England











FLOOD MANAGEMENT SOLUTIONS







UNIVERSITY OF GHANA

Norwegian Meteorological











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Final Considerations

- Prediction and risk assessment
- Early warning systems
- Technology affordability
- GPS signal
- Reliable internet
- Expertise (Drones, AI, ANN)
- Indigenous knowledge
- Regulatory framework
- Coordination & Communication



https://www.waterworld.com/international/utilities/article/16201296/flying-high-how-water-is-adopting-drones and the second se



Thank you for listening!

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Water Management Research Group

https://iris.ucl.ac.uk/iris/browse/researchGroup/1464