

Improving Spatial Monitoring of Dredging Operations: A Small Unmanned Aerial System Application to Map Turbidity

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**US Army Corps
of Engineers®**



DREDGING OPERATIONS RESUSPEND SEDIMENT



PLUME CHARACTERIZATION



**DREDGING OPERATIONS REQUIRE MONITORING
TYPICALLY FROM MANNED VESSELS.**



**IMAGES OF TURBIDITY HAVE BEEN
OBTAINED FROM SATELLITES AND
MANNED FLIGHTS.**



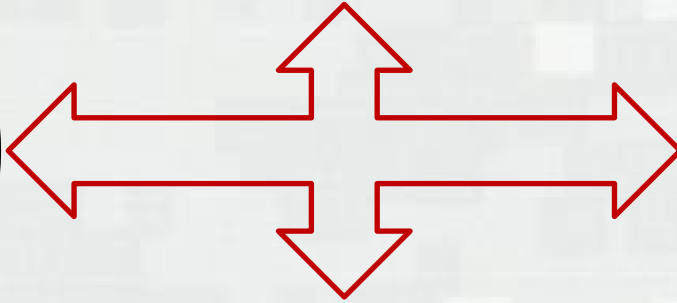
UAS TECHNOLOGIES



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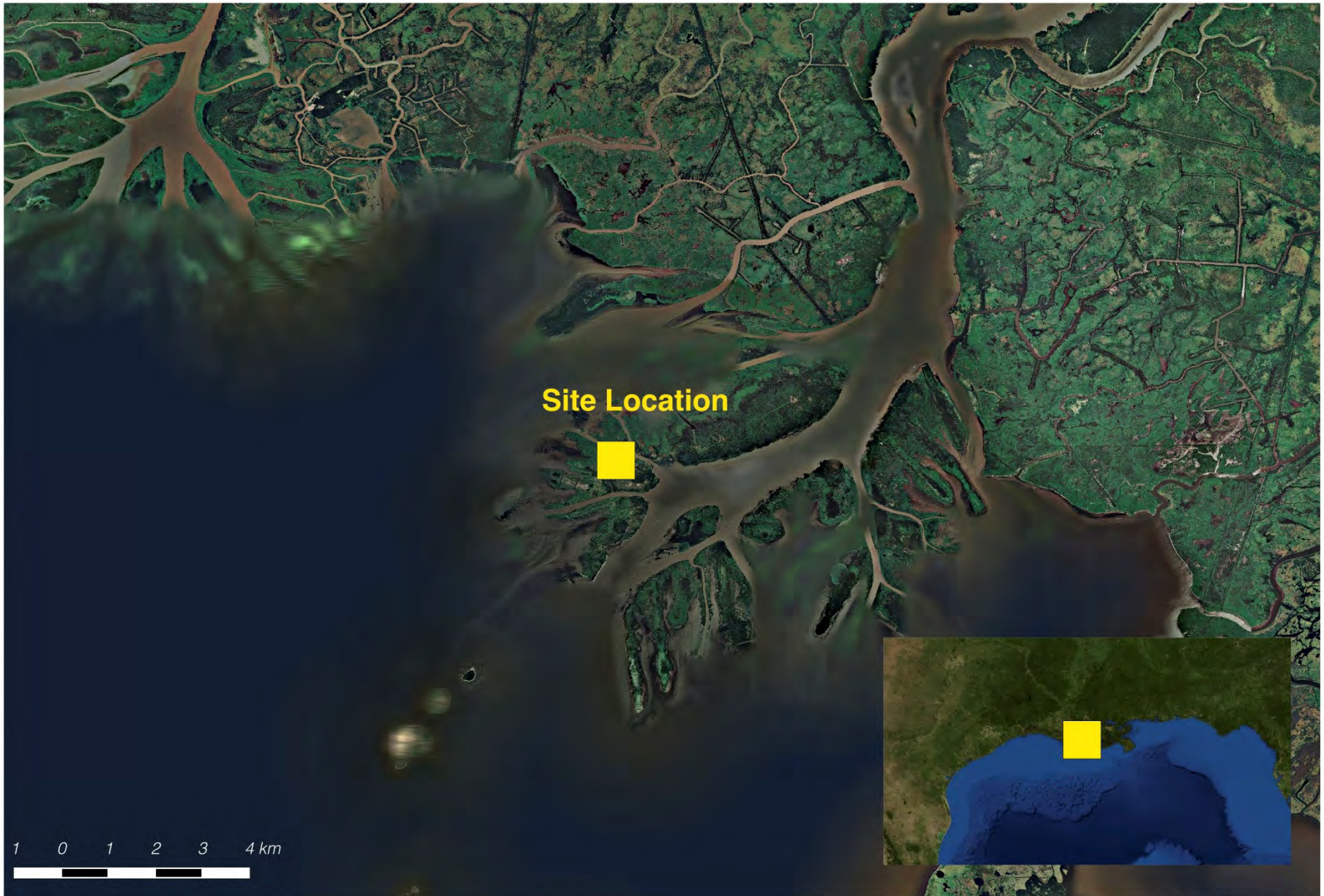
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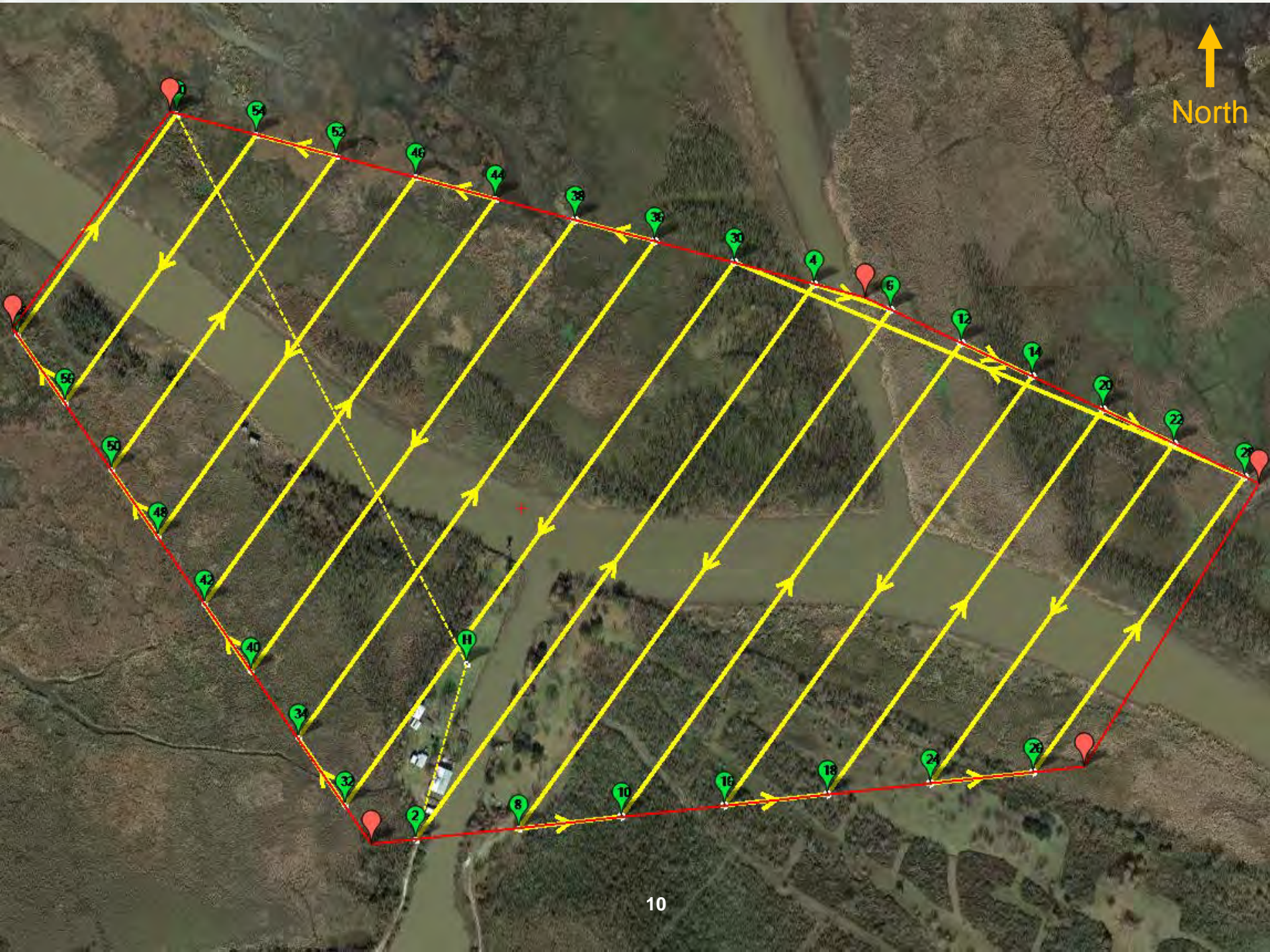
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Cartographer: Austin Davis, GISP, Environmental Systems Branch, ERDC



North





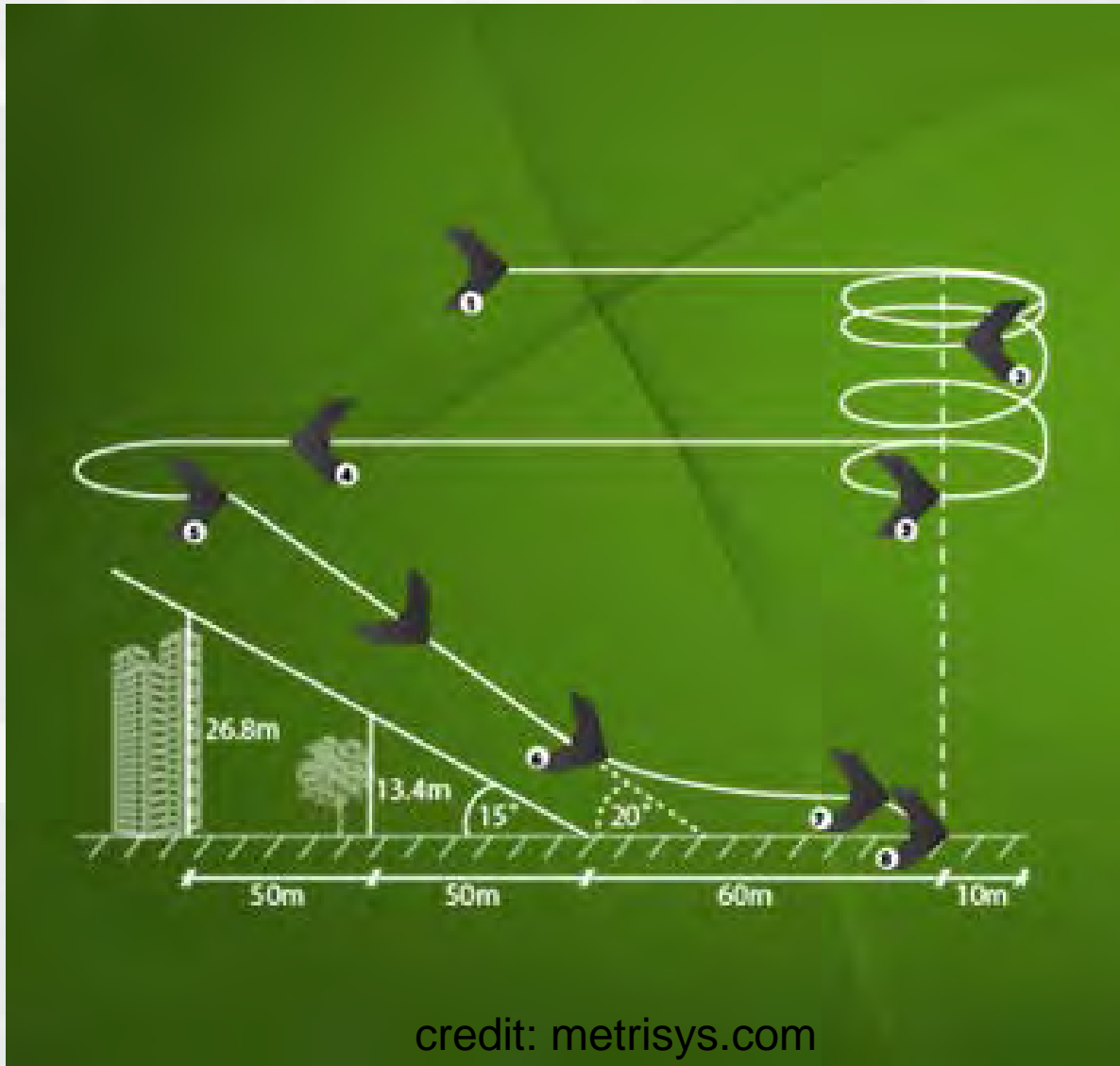
Video clip downloaded from Flickr. Credit: Jon Fisher, Drone Demo. Acquired still images from video to create GIF.



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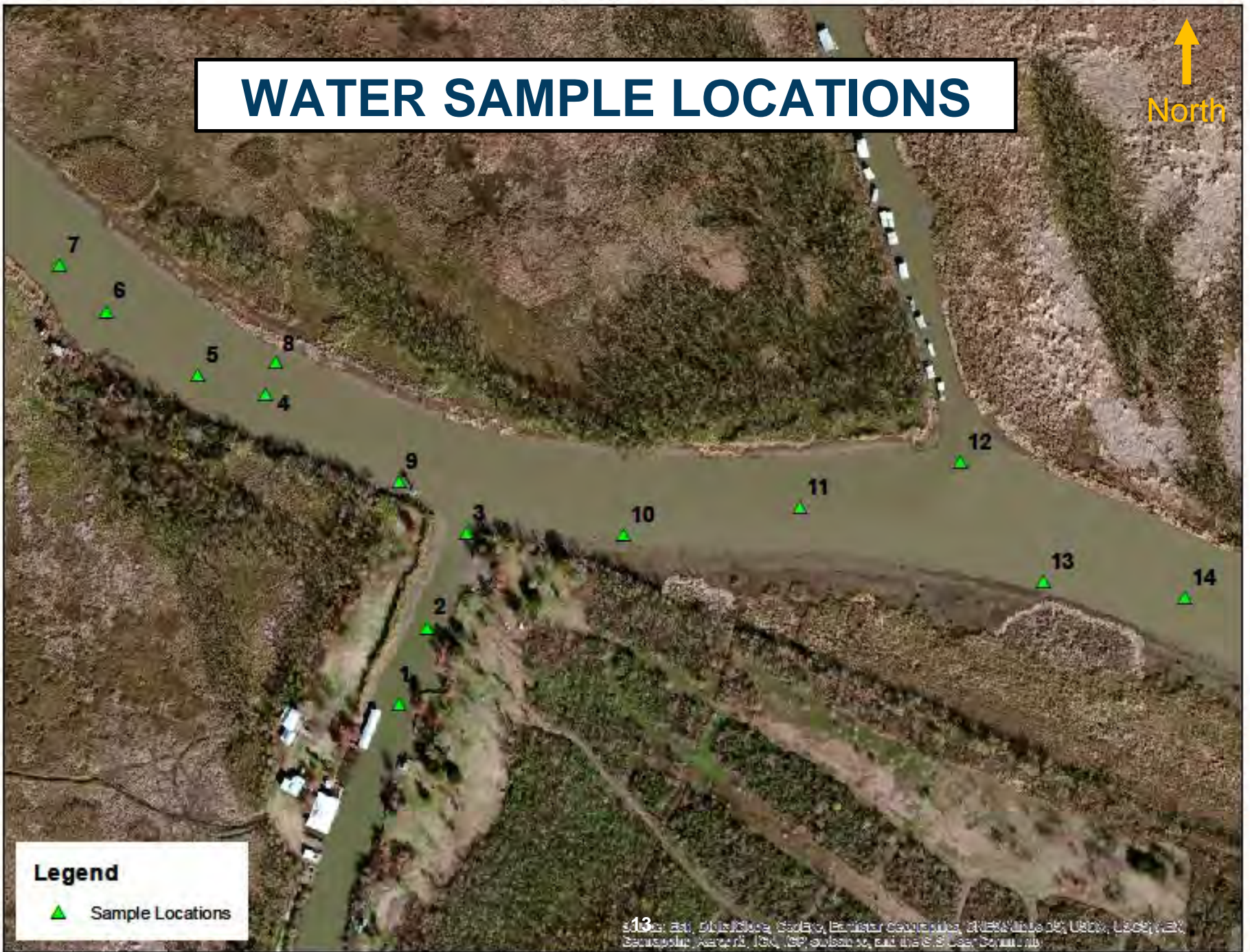
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credit: metrisys.com

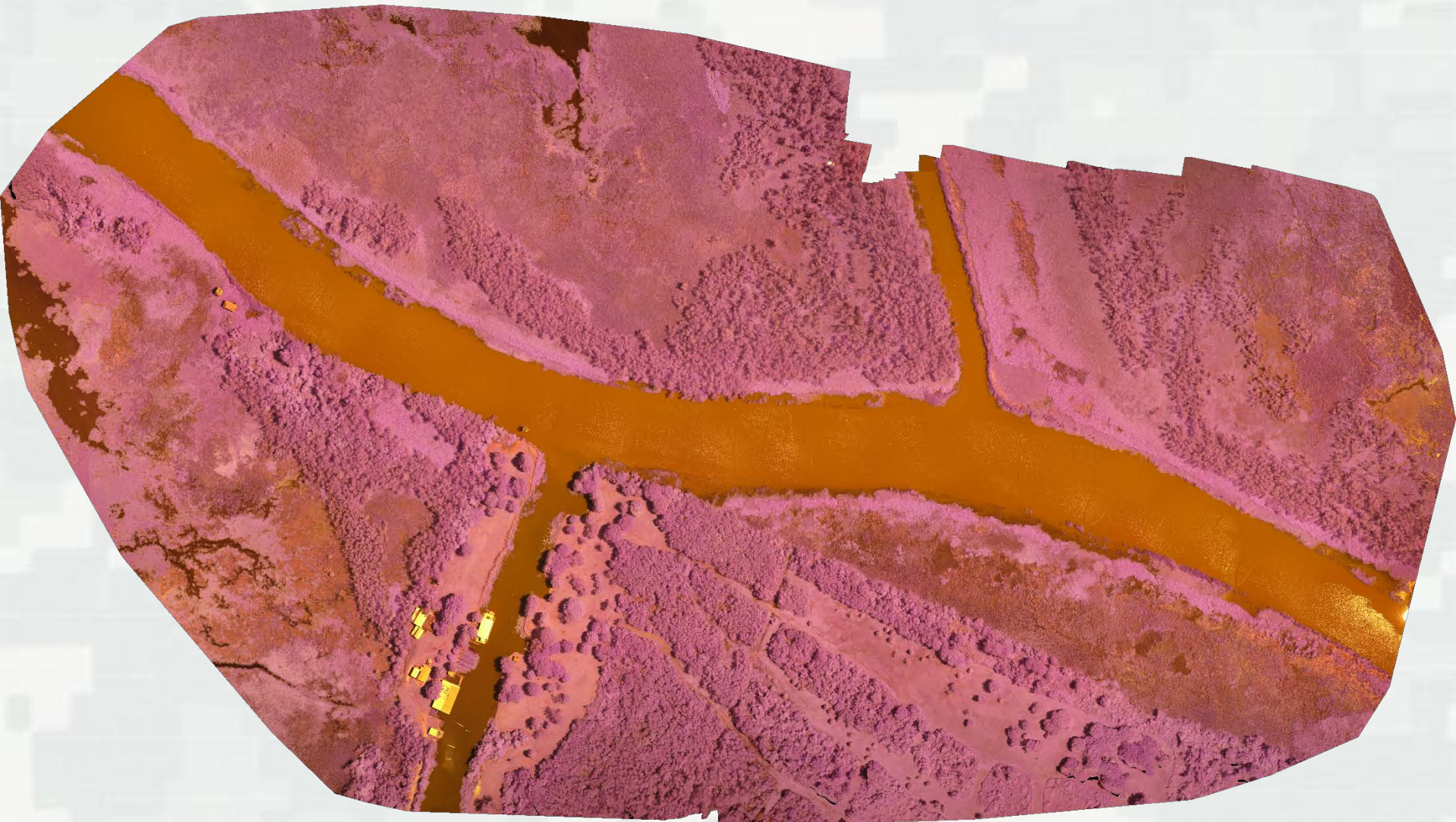


WATER SAMPLE LOCATIONS



Legend

▲ Sample Locations



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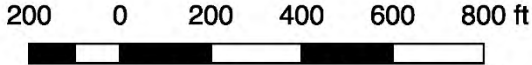
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Semi-automatic classification plugin for QGIS



Turbidity Estimate

- Less Turbid (≤ 25 NTU)
- More Turbid (> 25 NTU)



Cartographer: Austin Davis, GISP, Environmental Systems Branch, ERDC

Conclusion

- UAS technologies offer a viable and flexible alternative to conventional platforms.
- Relatively uniform turbidity levels can be differentiated.
- Appropriate for assessing turbidity near the surface or in shallow water habitats.
- Will improve spatial and temporal monitoring by documenting work footprint.



Path forward: balloon

