FUSING REMOTE SENSING DATA WITH SPATIOTEMPORAL IN SITU SAMPLES FOR RED TIDE DETECTION

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A novel method for combining remote sensing data with spatiotemporally distributed in situ water samples was developed to detect red tide (*Karenia brevis*) blooms off the southwest coast of Florida. The neural network classifier detects blooms (100,000 cells/L) over a 1 km grid, using six depth-normalized ocean color features from the full lifespan of the MODIS-Aqua remote sensing platform (2002-2021) and in situ red tide sample data collected by the Florida Fish and Wildlife Conservation Commission (FWC). The in-situ data were used to label the remotely sensed data for training and to generate a feature encoding recent, nearby ground truth (*K. brevis* concentrations) through a KNN spatiotemporal proximity weighting scheme. The network trained on both remotely sensed data and in situ data provided greater detection performance than either network trained on a single dataset, and the classifier outperformed several existing bloom detection methods. All code for this method is available on Github. (https://github.com/Compcon-UF/red-tide-ML)

PRESENTER BIO: Dr. Fick is a research scientist with the Center for Coastal Solutions. He completed his PhD in computer engineering focused on machine learning. He has been working to identify harmful algae blooms with remote sensing data.