Imaging and Classification System for Harmful Algal Bloom Detection

Lisa Campbell
Texas A&M University

Robert J. Olson, Heidi M. Sosik
Woods Hole Oceanographic Institution

The Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET)
OBJECTIVES:

Test deployment of Imaging FlowCytoBot (IFCB) at U. Texas – Marine Sciences Institute pier at entrance to Mission-Aransas NERR

Optimize automated classification with images of natural cells and co-occurring species

Establish a continuous monitoring program and disseminate results

Long-range goal: Evaluate modifications for smaller, simpler, non-cabled instrument.
Imaging FlowCytobot

Nano- and microplankton
Long term, high resolution
1) Filtered sheath fluid, sample in core

2) Recirculation with continuous biocide

3) Bleach-treatment of sample tubing

4) Nylon mesh excludes large particles

5) Copper prevents overgrowth

Long Term - Antifouling
Automated image analysis and classification

22 categories (16 phytoplankton genera)

88% overall accuracy
Example data from Woods Hole Harbor

- Fluorescence / scattering signature
- Associated images
IFCB cell counts are comparable to those from manual microscopy.
Automated classification of *Karenia* (albeit against Woods Hole plankton) was encouraging (>95% accuracy).
K. brevis
Deployment on UT-MSI pier