

# Turner Designs' Fluorometric Integrated Nautical Mapping System (C-FINS)

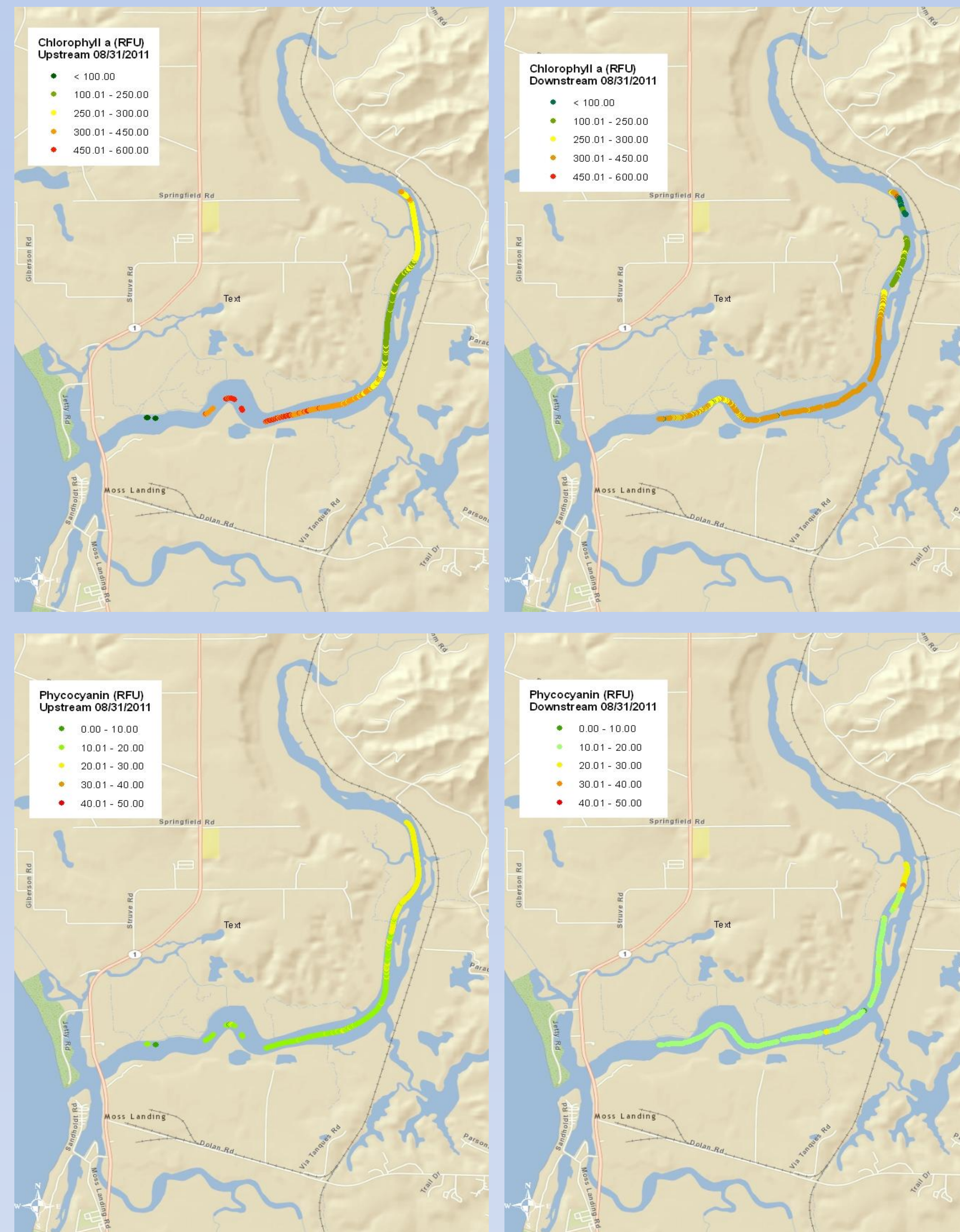
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**Introduction** — The basis of the C-FINS package developed by Turner Designs is a C3 Submersible Fluorometer which is used for *in situ* detection of multiple chemical or biological fluorophores and measurement of physical parameters (turbidity, temperature, depth). Housed in our C-ray tow body and integrated with ArcGIS® 10 software via our add-in module, this package allows users to quickly analyze and easily map real-time data over large areas or distances.

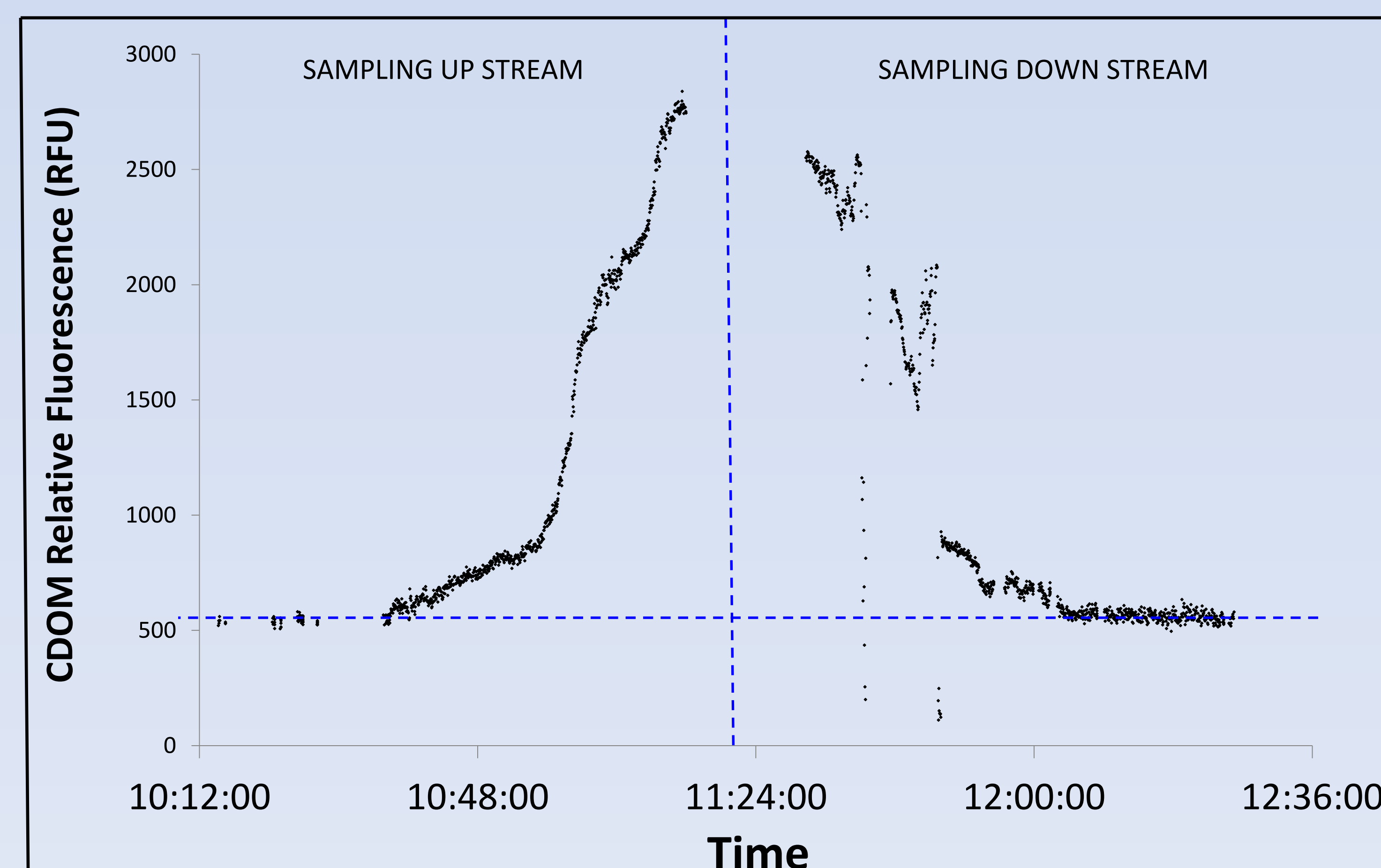
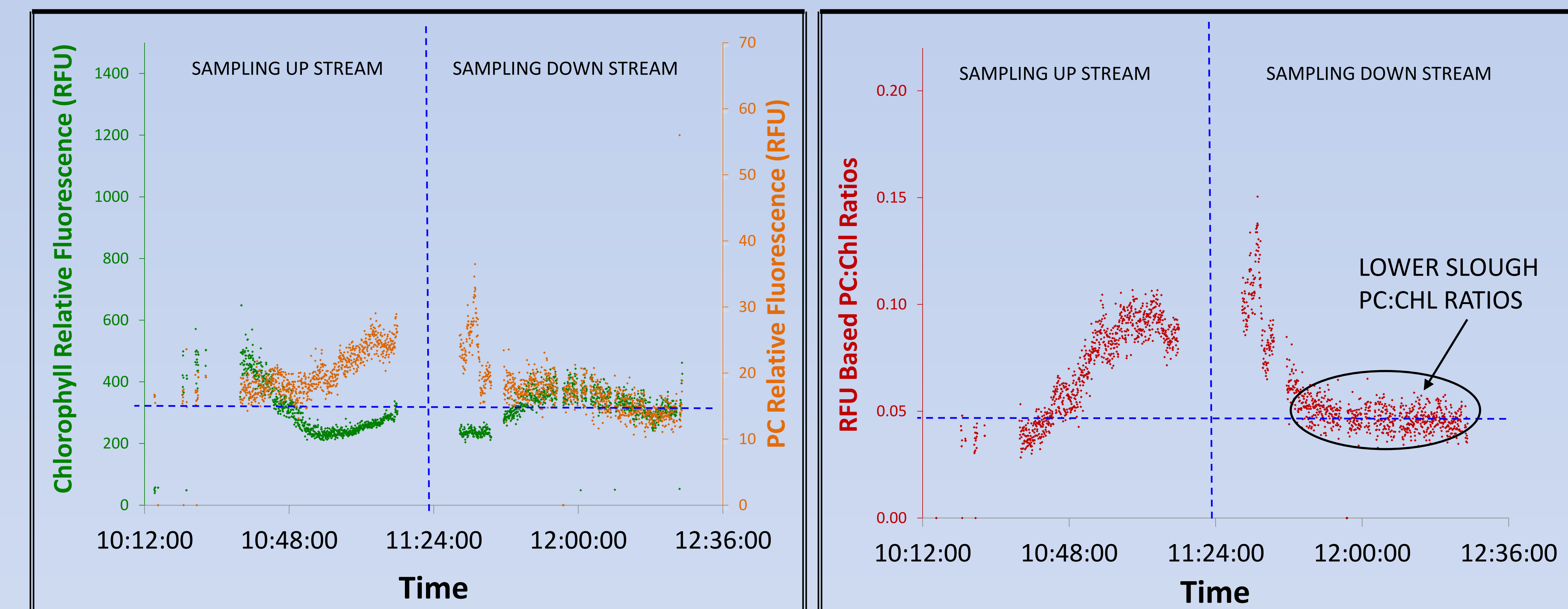


**Study Site** — Elkhorn Slough is a tidally mixed seasonal estuary. The northeast (upper) part of the slough is highly dynamic year round, ranging in salinity, water temperature, and DOM load. The upper slough's microcosm-like characteristics make Elkhorn Slough an interesting site for looking at possible phytoplankton community changes across very different water types.

**Sampling** — C-FINS configured for CDOM, Phycocyanin (PC), and Chlorophyll (CHL) detection was towed through Elkhorn Slough from Moss Landing Harbor (lower slough) to Kirby Park (upper slough) and back, during a flood tide. Tow speed was approximately 2.5 knots at a depth of about 1.5 meters. Real-time data were logged and mapped once per second.



**Results/Discussion** — Approaching the upper slough, CHL fluorescence decreased while the fluorescence of PC (a pigment specific to blue-green algae) increased. The higher PC:CHL ratios in the upper slough seem to indicate an algal community which is primarily dominated by PC-containing algae, much different from the community in the lower part of the slough. CDOM concentrations in the upper slough were ~5x greater than the lower slough's tidally influenced water. Higher DOM concentrations decrease light availability in the water column limiting photosynthesis. However, these conditions are ideal for mixotrophic algae, supporting the idea of a split community within Elkhorn Slough.



**Conclusion** — A quick (< 2 hr) survey of the slough using C-FINS provided us with a detailed data set and maps which can be used for rapidly analyzing and documenting changes that occurred throughout the slough for the time period of this study. The most useful part of this sampling method is that everything is done in real-time; no samples are collected and post-processed, therefore the possibility of altering the state of the algal cell or changing the water's characteristics is greatly minimized. The C-FINS package is a powerful tool for rapid assessment of physical, chemical, or biological characteristics in aquatic systems.

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