NOAA Chesapeake Bay Office
Seasonal Summaries for Fishery Management

Purpose

The NOAA Chesapeake Bay Office (NCBO) will be developing seasonal summaries of water quality parameters in the Chesapeake Bay to provide fisheries managers and the public information about recent environmental conditions, how they compare to long-term averages, and how these conditions might affect key fishery resources. Seasons will be evaluated as follows: winter (Dec-Feb); spring (Mar-May); summer (Jun-Aug); fall (Sep-Nov). An annual synthesis will be prepared for inclusion in the Mid-Atlantic State of the Ecosystem Report, which is developed by the Northeast Fisheries Science Center and presented to the Mid Atlantic Fishery Management Council each year. The intent is to provide information linking changes in environmental conditions to living resource impacts to inform ecosystem based management. We are currently evaluating which buoys are best to use for these summaries.

Data Sources

The primary data sources for the seasonal summaries will be NOAA's Chesapeake Bay Interpretive Buoy System (CBIBS) and NOAA's CoastWatch Program. CBIBS buoys are located throughout the Bay and provide real-time water quality information such as water temperature and salinity. The CoastWatch Program uses satellite data to provide observations of sea surface temperature anomalies throughout the Bay.

Buoy Selection

To ensure that the seasonal summaries use the best available data, NCBO developed criteria for buoy selection. First, data should represent environmental conditions across the entire Bay. Second, the buoy should have sufficient data history to assess current conditions relative to long-term averages. To satisfy the first criteria, the Bay was split into salinity regimes (polyhaline, mesohaline, oligohaline) and the CBIBS buoy location map (Figure 1) was examined to determine which buoys could be used to represent each region. Then, the available historical data for each potential buoy in each region were examined to determine which buoy would provide the best long-term averages and still be in use in the near future. Of the remaining buoys in each region, plots of salinity and water temperature observations were generated to determine if a single buoy platform could represent the entire salinity regime. Salinity and water temperature trends were similar across buoys in a given regime, such that one buoy could be used for each region. Buoy selection was therefore narrowed down to Annapolis (AN; oligohaline), York Spit (YS; polyhaline), Gooses Reef (GR; mesohaline), and Point Lookout at the mouth of the Potomac River (PL; mesohaline).

NCBO is evaluating the management value of each buoy in the mesohaline portion of the Bay (GR near the Choptank River complex and PL at the mouth of the Potomac River). PL would likely provide information about freshwater pulses that come from the Potomac, potentially affecting Potomac River fisheries. GR may provide better information about the hypoxic region of the Bay mainstem and potentially insight into environmental conditions of the Choptank River complex, an important habitat region for fishery species. Figures 2 and 3 show the salinity and water temperature trends for the buoys being considered for the seasonal summaries.

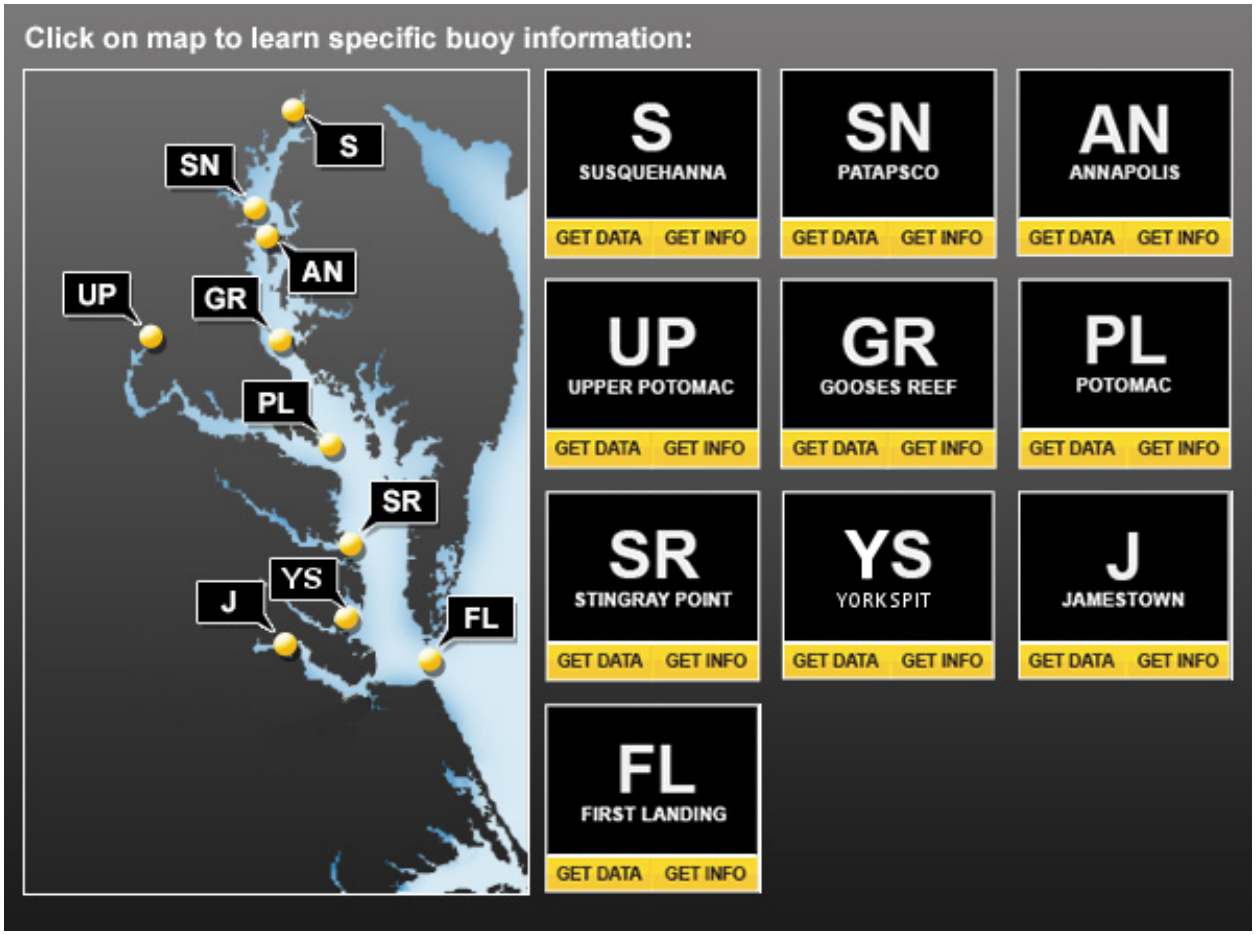

Figure 1. Map of CBIBS buoy locations in the Chesapeake Bay.

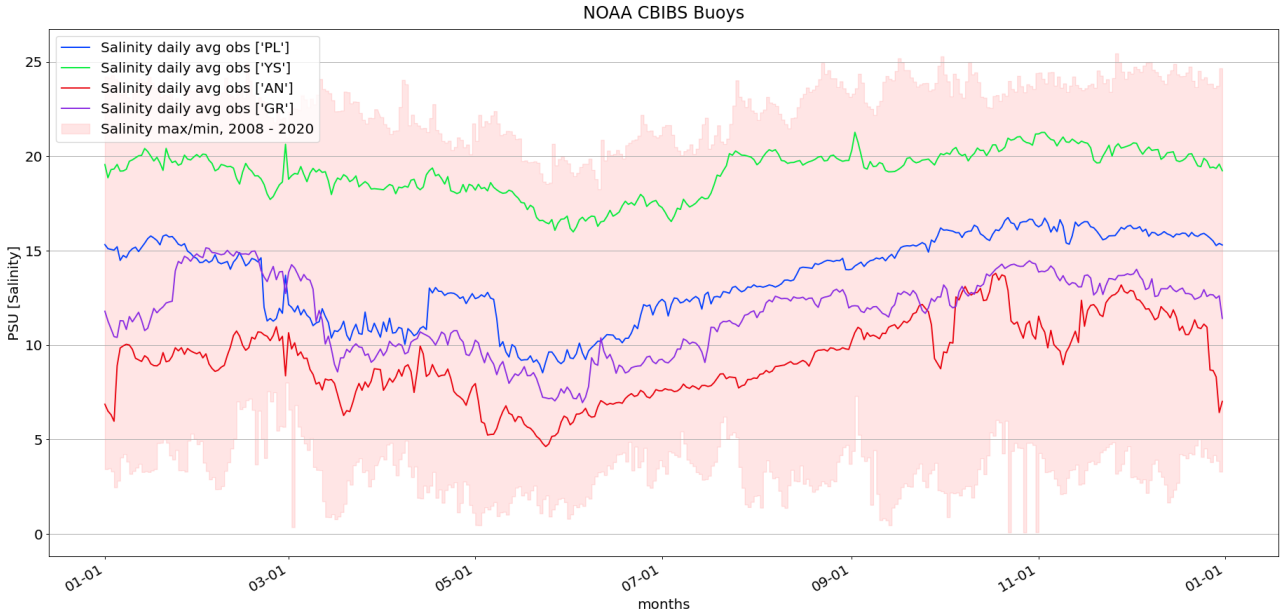

Figure 2. Long-term daily average salinity observations at each of the buoys being considered for the seasonal summaries, including Annapolis (AN), Gooses Reef (GR), Point Lookout (PL), and York Spit (YS).

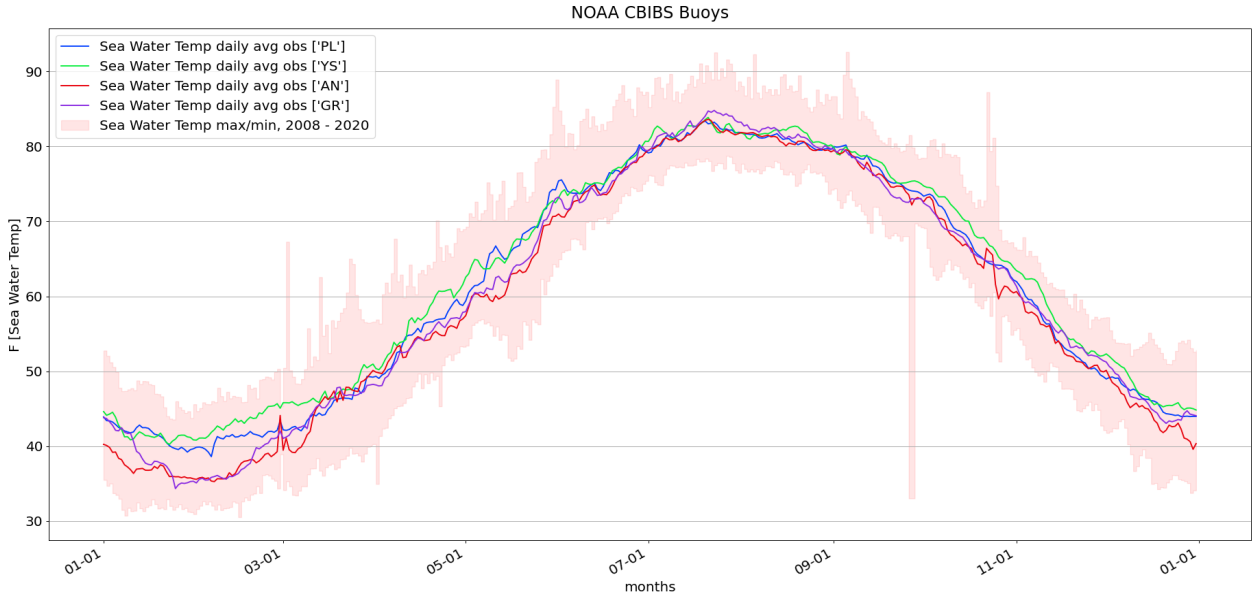

Figure 3. Long-term daily average water temperature observations at each of the buoys being considered for the seasonal summaries, including Annapolis (AN), Gooses Reef (GR), Point Lookout (PL), and York Spit (YS).