

# False Bay Watershed Report ver. 1.2

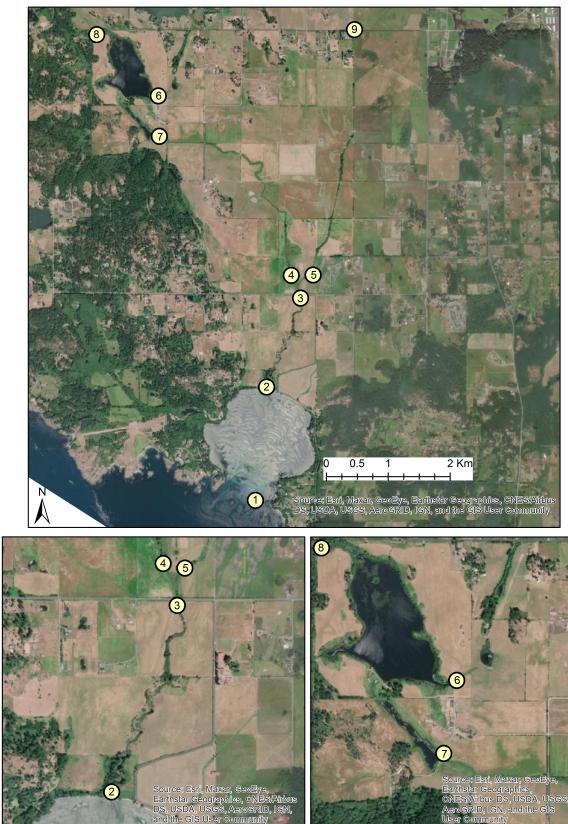
Wendel Raymond

1/3/2022

## Overview

This report compiles available watershed monitoring data to date. This includes periodic water quality sampling and flow rate data from Lucy Kramer's Friday Harbor Labs BMEE research apprenticeship project. The overall goal of the monitoring project is to gather consistent water quality data from key locations in the False Bay watershed ranging from completely fresh to completely marine. The hope is that these data can be useful to ongoing and future management, restoration, and scientific projects in the watershed and nearshore environment.

## Sampling locations



Sampling occurs at stations from the inlet to Lake Zylstra and the upper reaches of San Juan Valley Creek down the watershed to the mouth of False Bay Creek and the False Bay nearshore environment.

- Station 1: False Bay (FB) - Nearshore
- Station 2: False Bay Creek (FBC) - Mouth
- Station 3: FBC - Bailer Hill
- Station 4: FBC - Lower
- Station 5: San Juan Valley Creek (SJVC) - Lower
- Station 6: Emmerling Creek - Outlet
- Station 7: Lake Zylstra (LZ) - Lower Dam
- Station 8: LZ - Inlet
- Station 9: SJVC - Upper

An additional station is located just upstream from Station 8 near the Town of Friday Harbor Augmentation 2 (“AUG-2”) water plant, where flow is measured.

## Parameters

To date we have collected basic water quality and nutrient data at sampling stations.

At all stations the following are measured

- Water Temperature ( $^{\circ}\text{C}$ )
- Salinity (ppt)
- Dissolved oxygen (mg/l and %)
- Specific conductivity
- Total nitrogen (micromol)
- Total phosphorus (micromol)

At station 1 and 2, all the above are measured plus

- Ortho-phosphate
- Nitrate ( $\mu\text{mol/l}$ )
- Nitrite ( $\mu\text{mol/l}$ )
- Ammonium ( $\mu\text{mol/l}$ )
- Silicate ( $\mu\text{mol/l}$ )

At station 3 and at AUG-2, water flow (CFS) is measured

We also present monthly precipitation totals and mean maximum and minimum temperatures measured at the Friday Harbor Airport

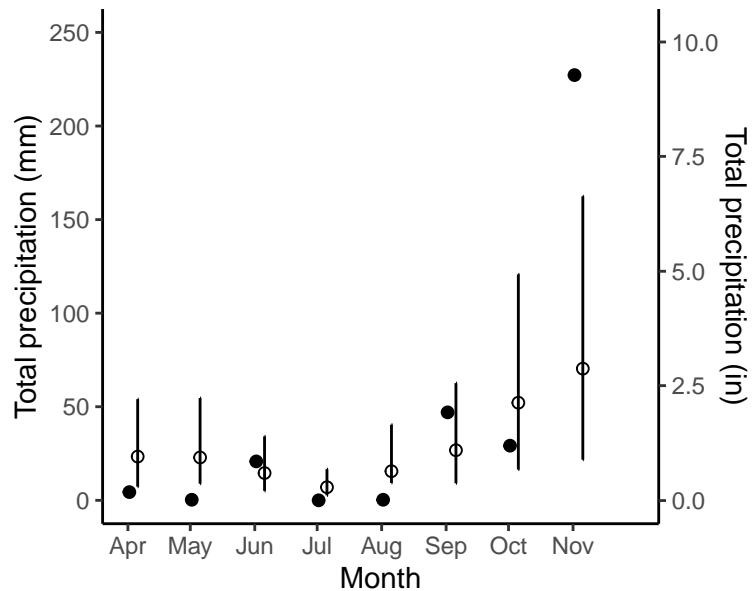
## Data not presented in this report

1. Temperature loggers are currently deployed at all sampling station but the data has not been retrieved.
2. Drone images from False Bay flown once a month May - September.
3. *Ulva* sp. biomass estimates from monthly sampling.

## Data

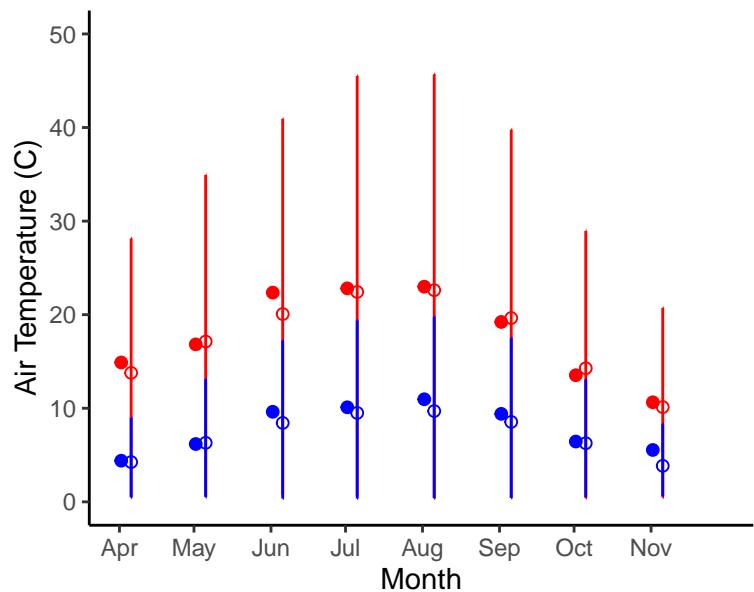
Below are plots of precipitation, air temperature, stream flow, and water quality parameters from the False Bay Watershed sampling stations.

## Precipitation



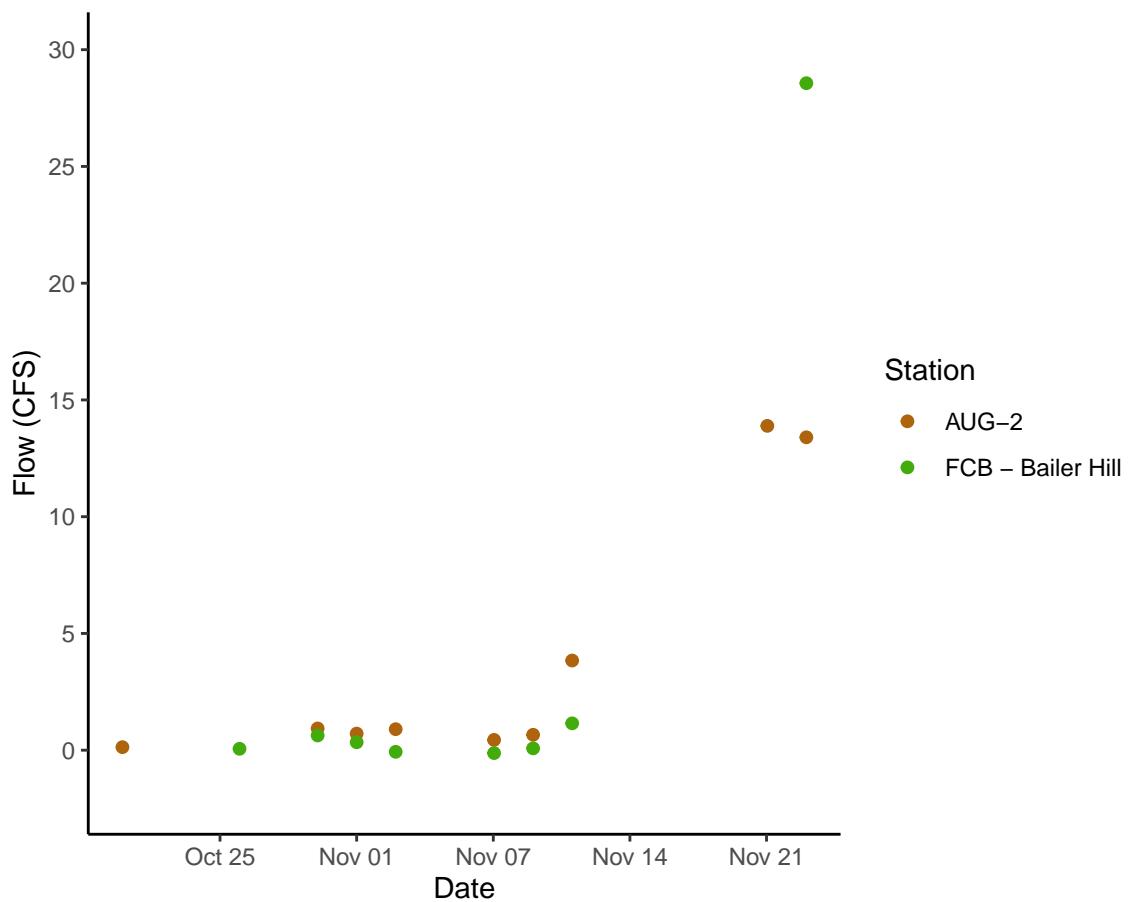
Total monthly precipitation (solid black) and long term (2000 - 2021) mean total monthly precipitation (open black) +/- 95% CI.

## Air Temperature



April to November 2021 monthly mean daily maximum (solid red) and minimum (solid blue) air temperature. Long term (2000 - 2021) monthly mean maximum (open red) and minimum (open blue) air temperature +/- 95% CI. Data from Friday Harbor Airport.

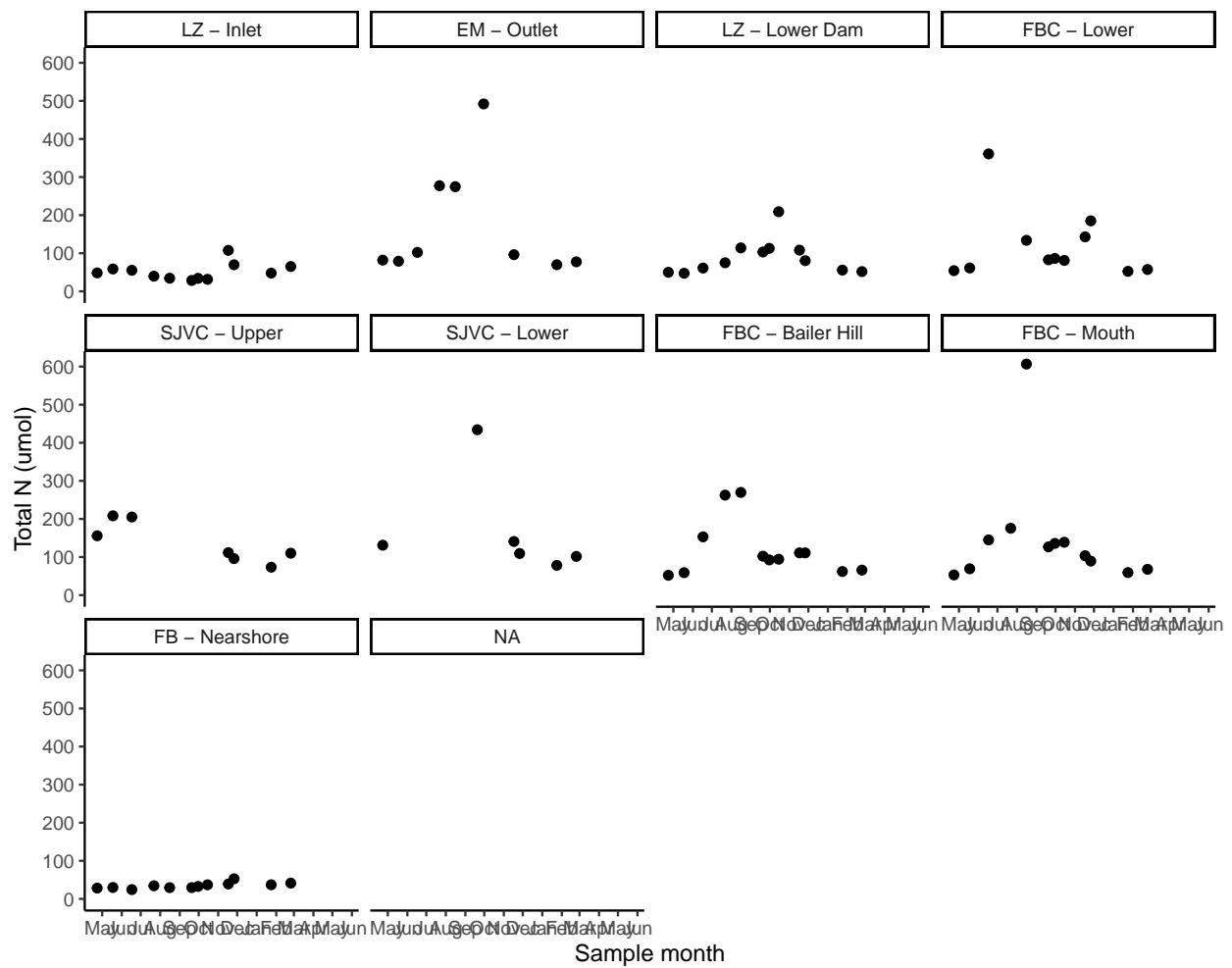
## Flow



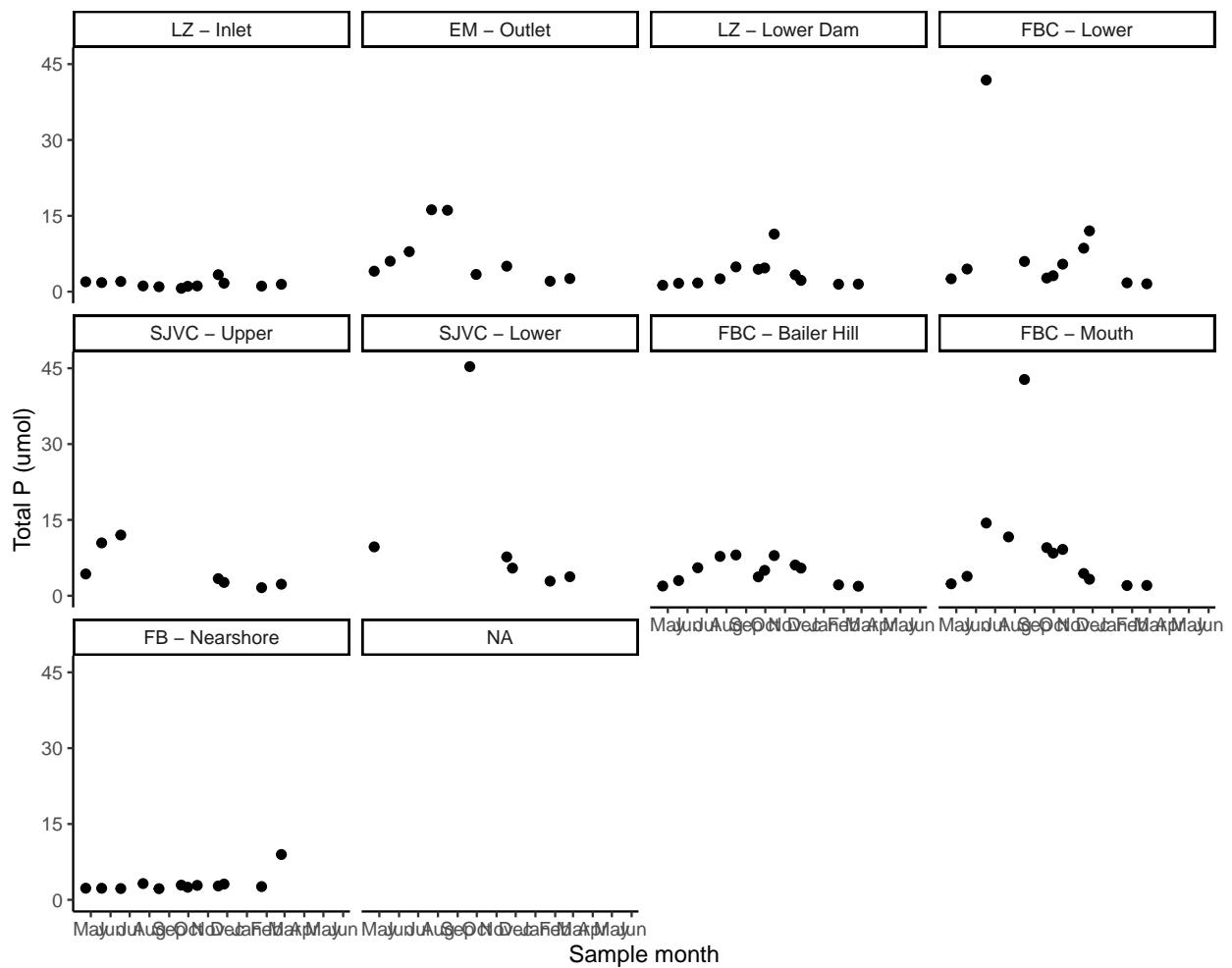
Stream flow at AUG-2 (brown) and Baler Hill Road (green). Note limited date range.

## Total nitrogen and phosphorus

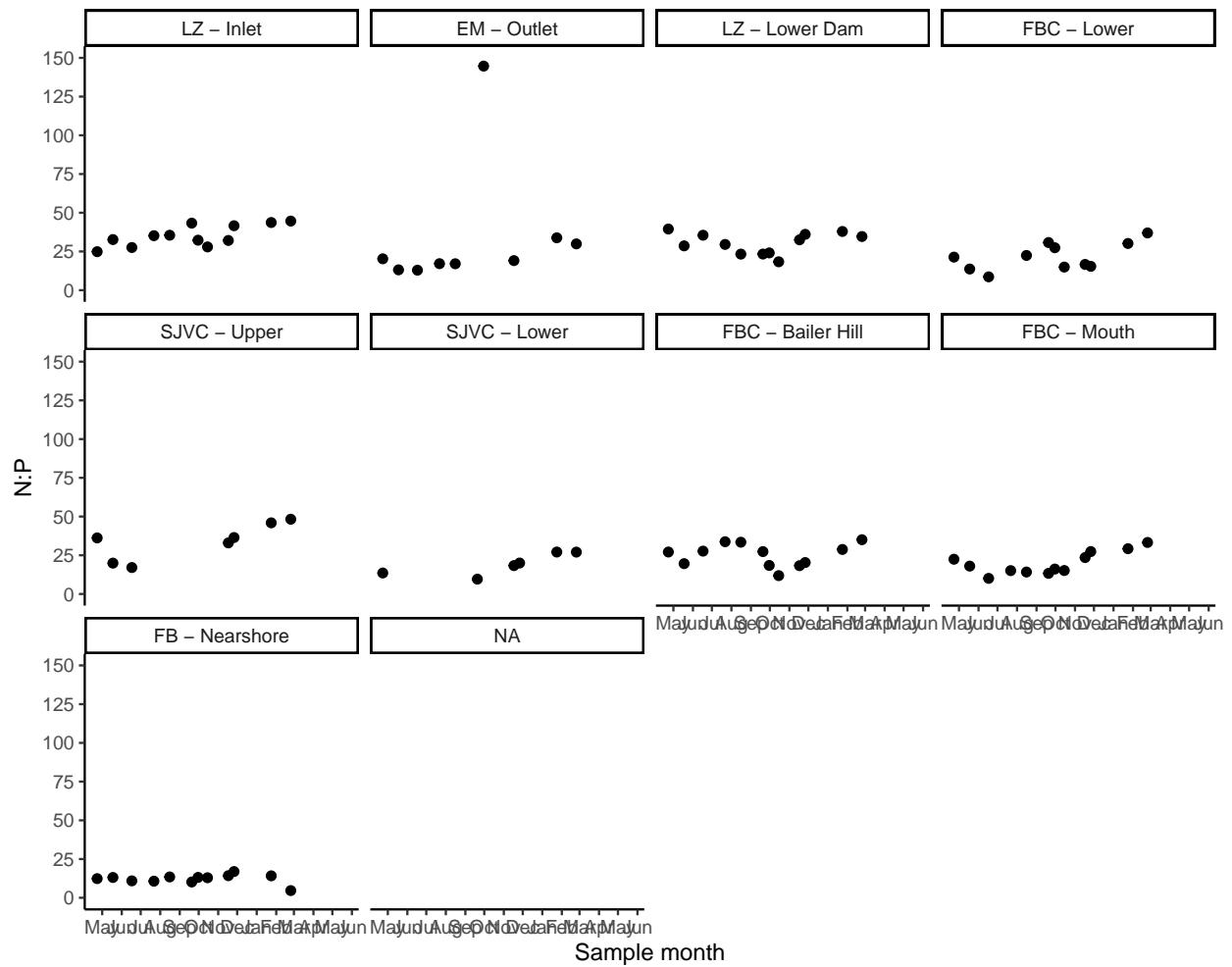
### Total nitrogen



Total phosphorus

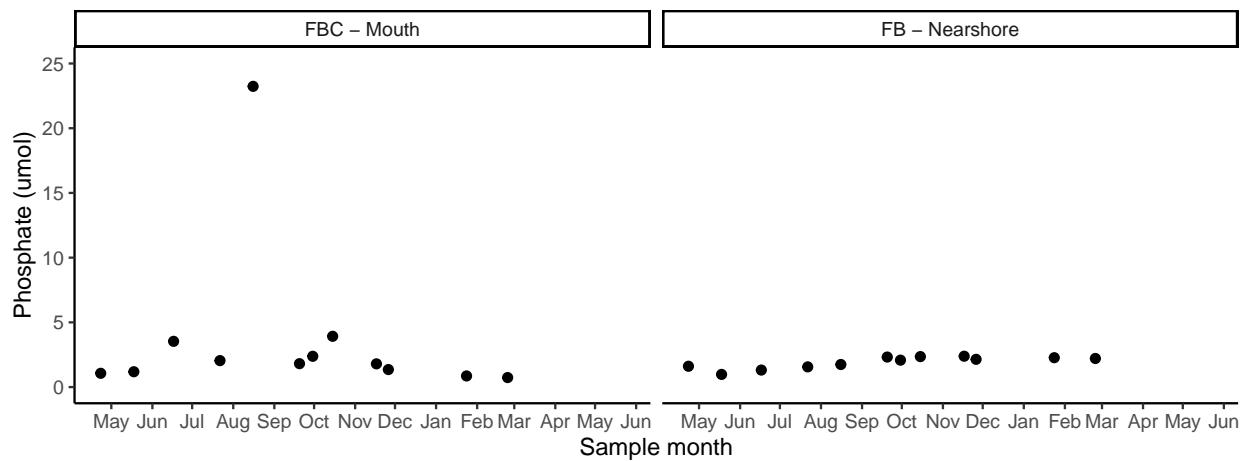


## N:P Ratio

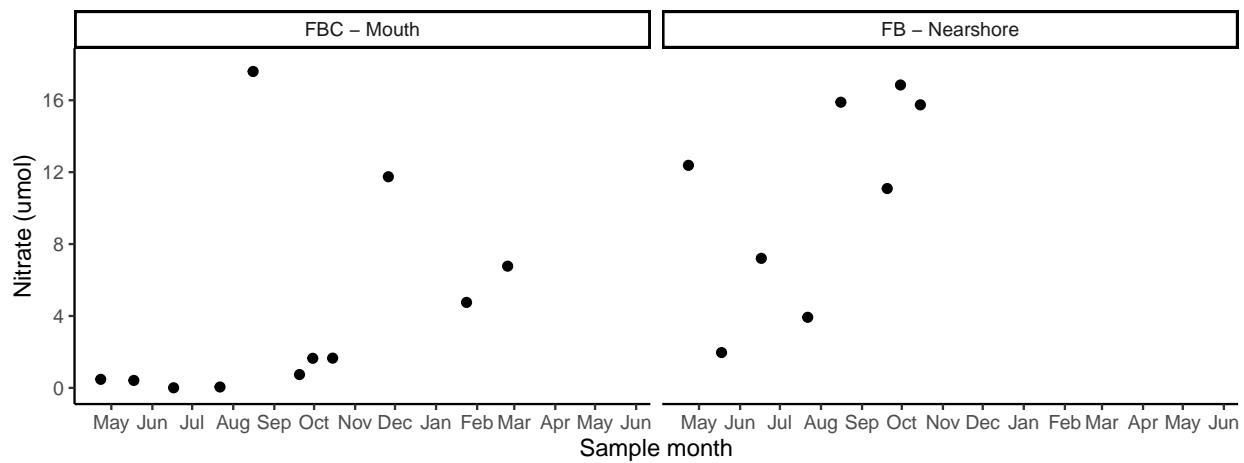


## Nutrients

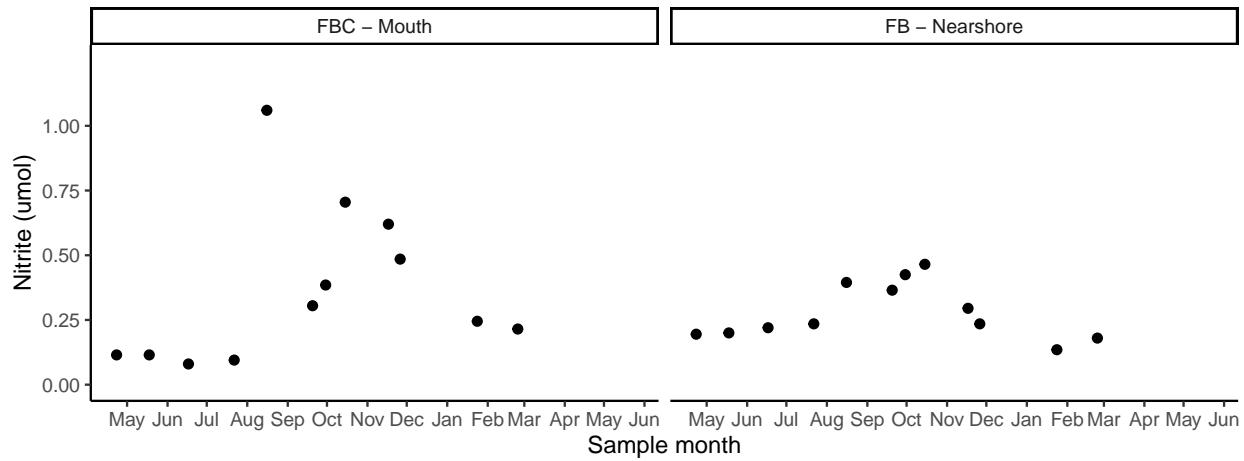
Phosphate



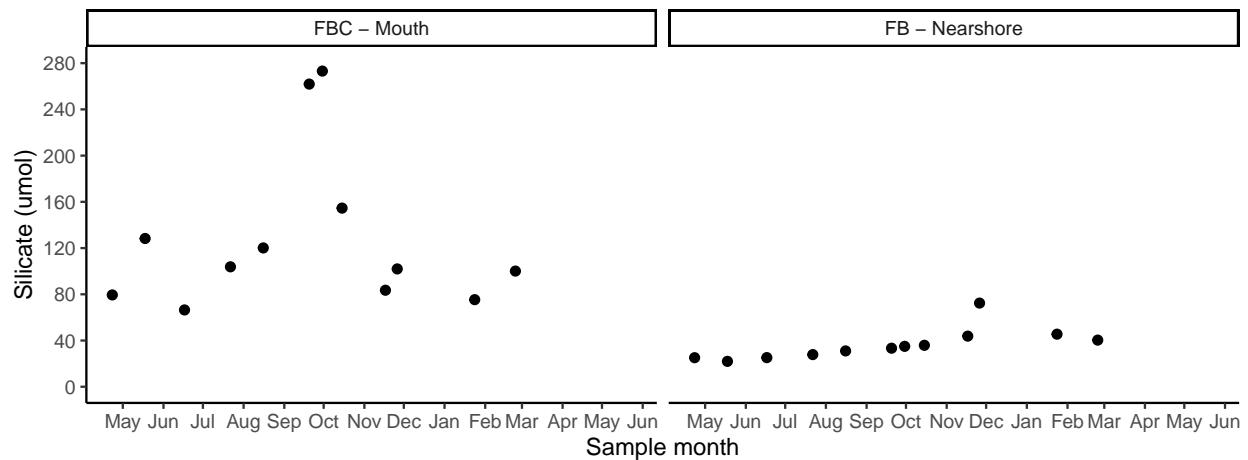
Nitrate



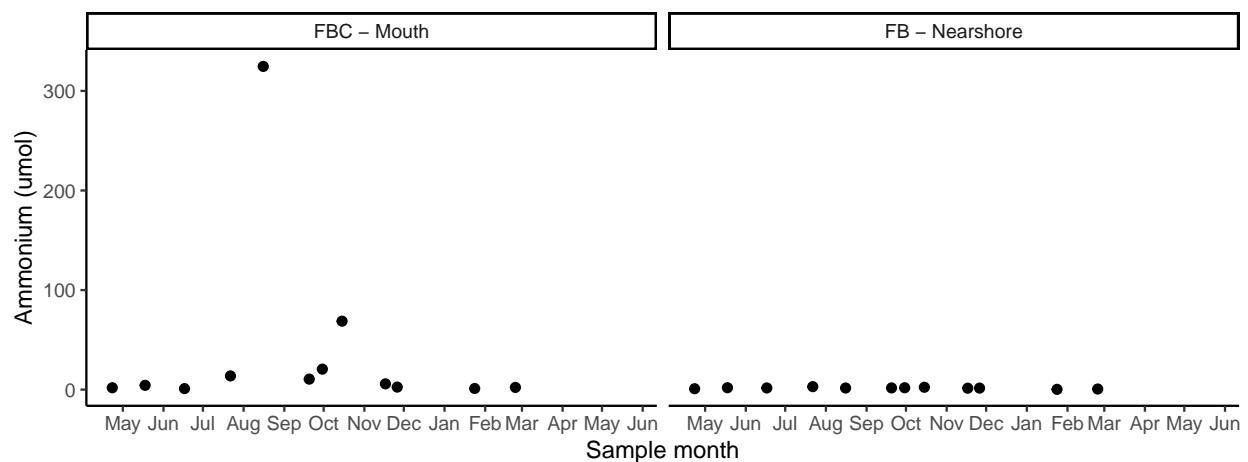
Nitrite



## Silicate

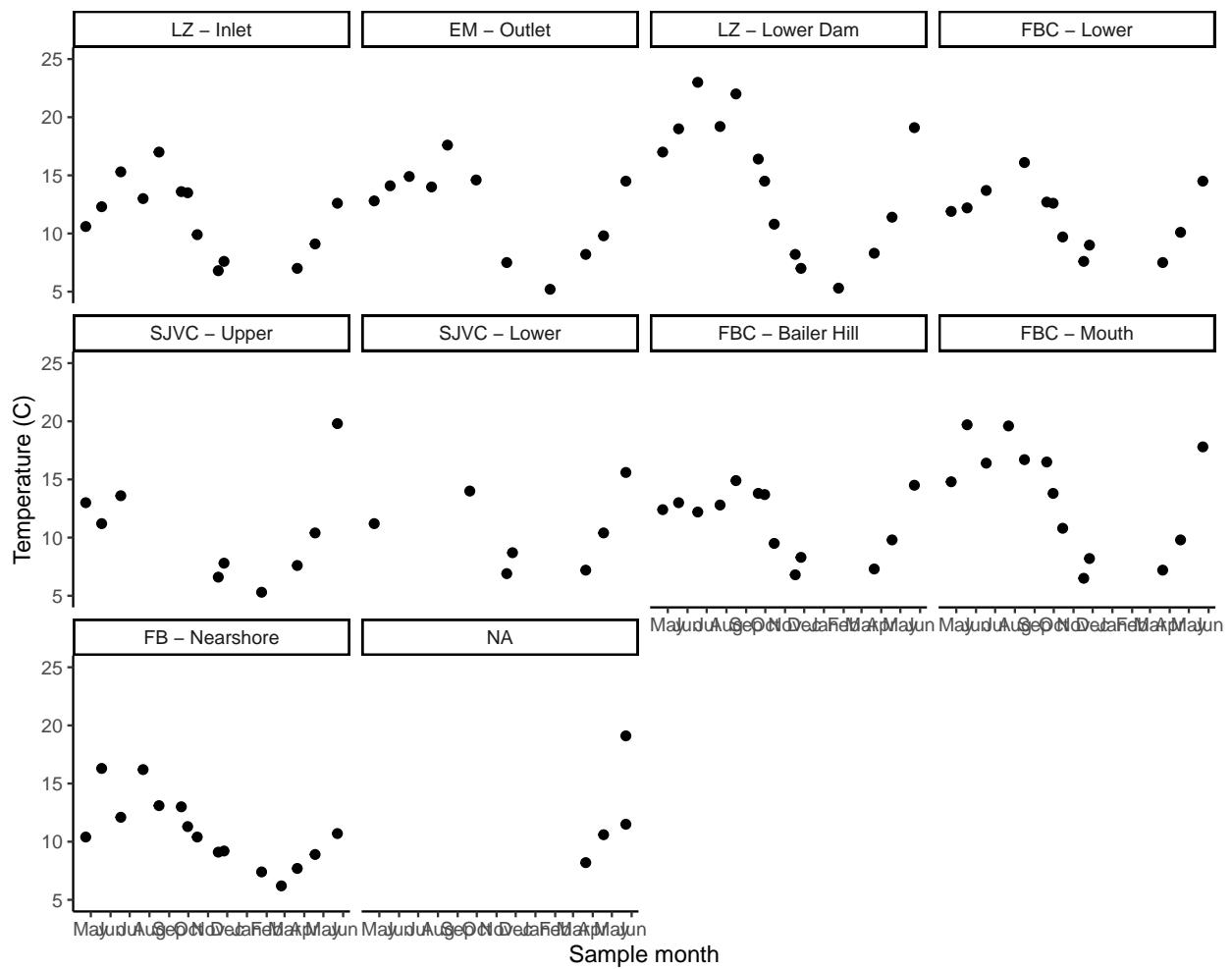


## Ammonium

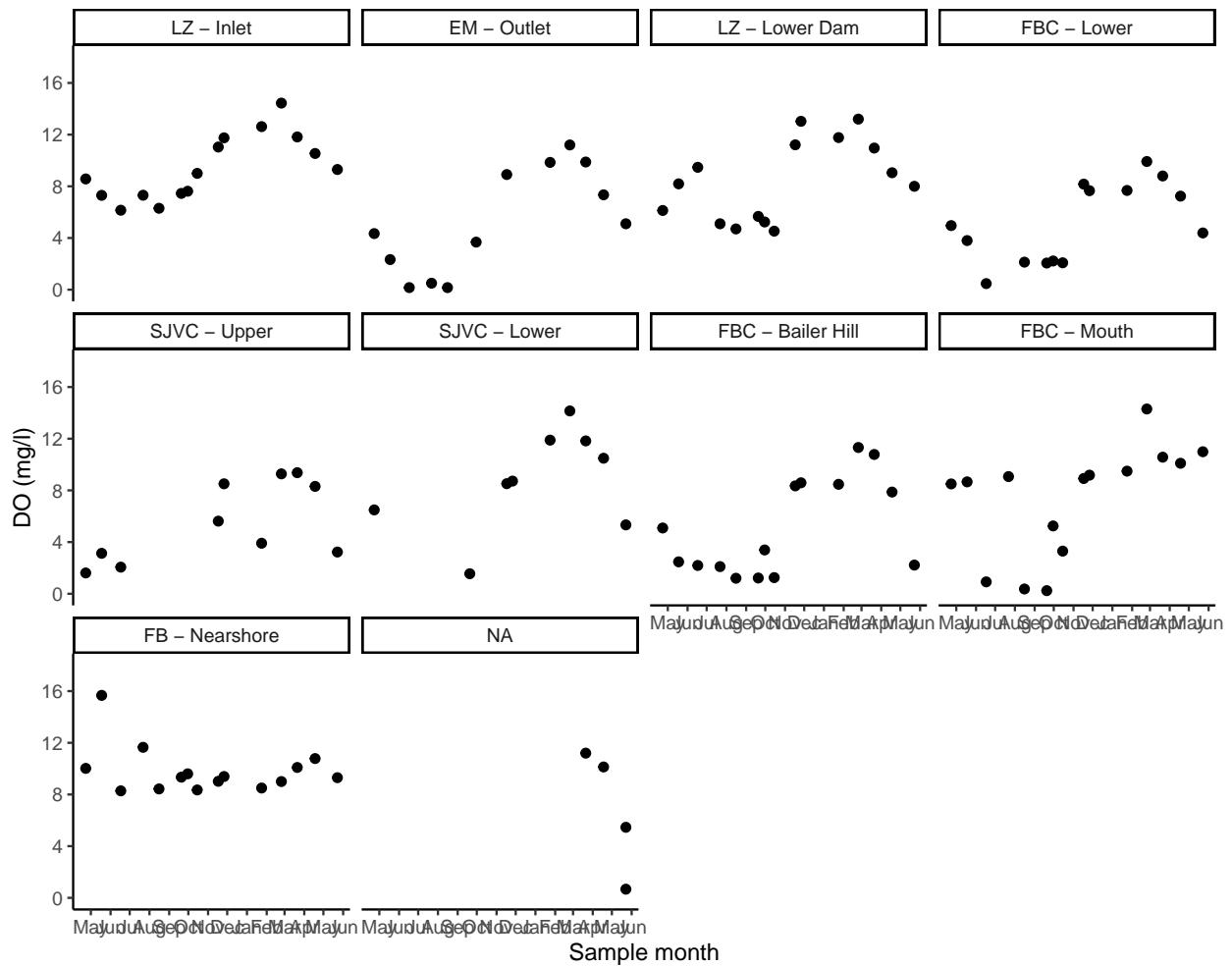


## Water condition

### Temperature



Dissolved oxygen



## Salinity

