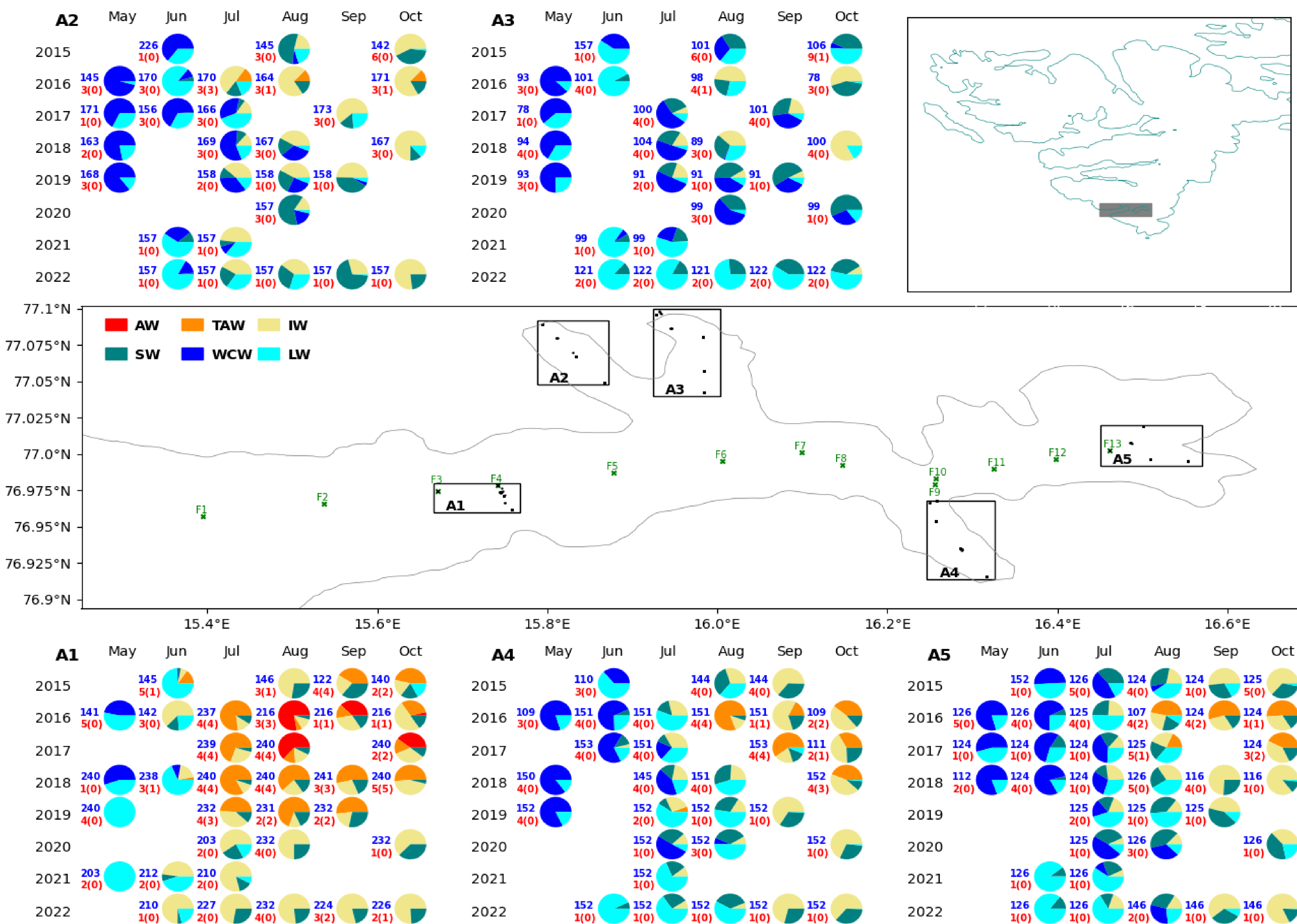


# Atlantic Water influence in Hornsund fjord, Svalbard

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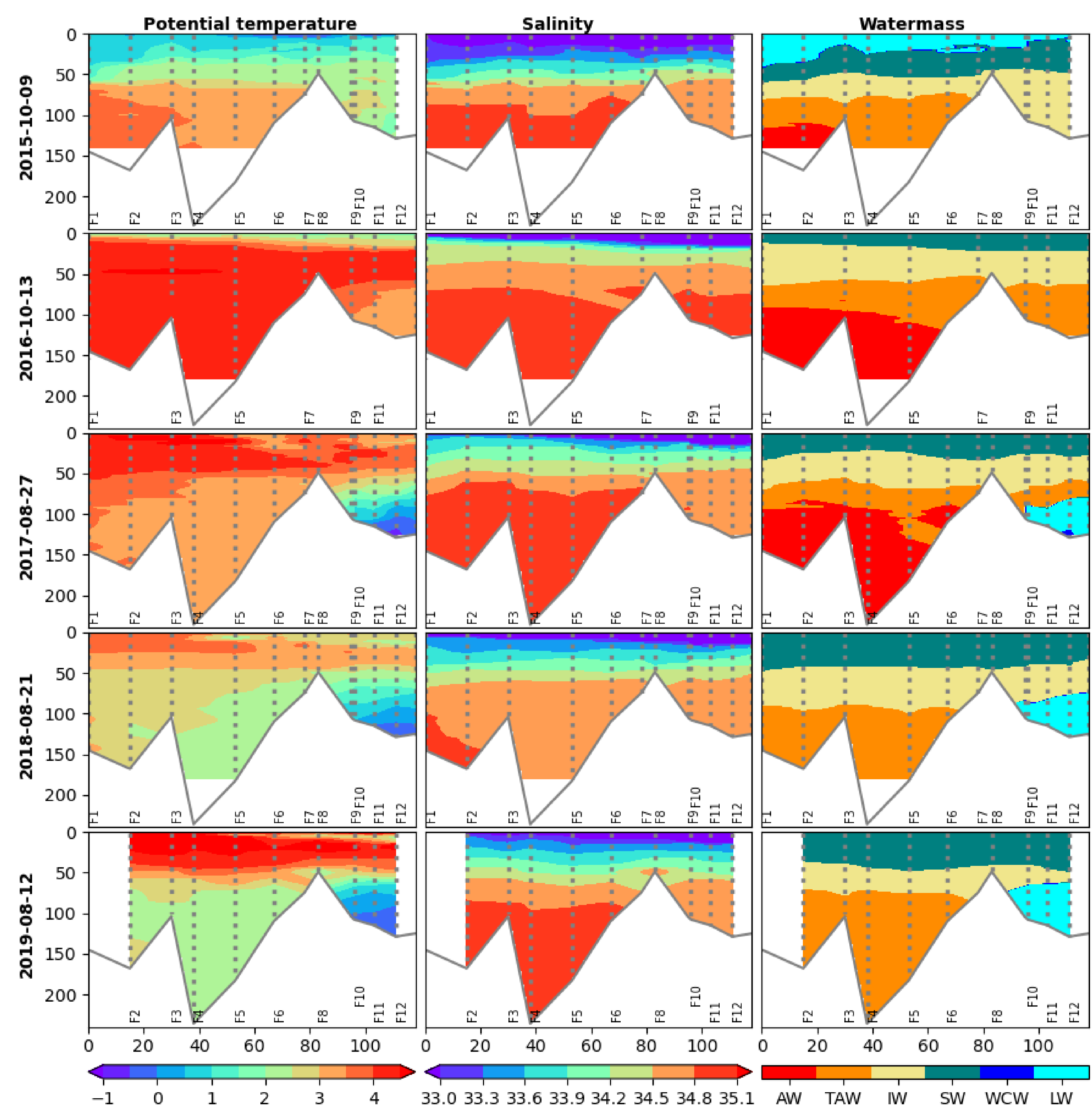


**Fig 1: Water masses in the Hornsund fjord**

The black rectangles mark areas representing main fjord, Burgerbukta Vestre, Burgerbukta Austre, Samarinvagen, and Brepollen, numbered respectively from A1 to A5. Pie-charts indicate the fraction of different water masses in the deepest CTD profile available in May to October months (columns) of 2015 to 2022 (rows) for each of these areas. The numbers to the left of each pie-chart indicate the depth of the chosen profile (blue), number of profiles available (red) and number of profiles with 10% or more Atlantic Water (AW)/ Transformed Atlantic Water (TAW) fraction (red number in brackets). The green crosses mark a section along the length of the fjord. The black circles mark all CTD stations in the respective areas. Inset in the top-right corner shows the Svalbard region, and gray rectangle marks the Hornsund fjord.

**Key Features:**

- a. Atlantic Water (AW)/ Transformed Atlantic Water (TAW) detected in the main fjord in the years 2015 to 2019, and to a lesser extent in 2022.
- b. No AW/TAW observed in years 2020 and 2021. Lower temperature and lower salinity waters dominate near the fjord mouth in these years in the reanalysis data (figure not shown).
- c. TAW detected close to the glaciers in Burgerbukta, Samarinvagen and Brepollen in some years.
- d. Widespread and intensive intrusion of AW/TAW in 2016 and 2017.

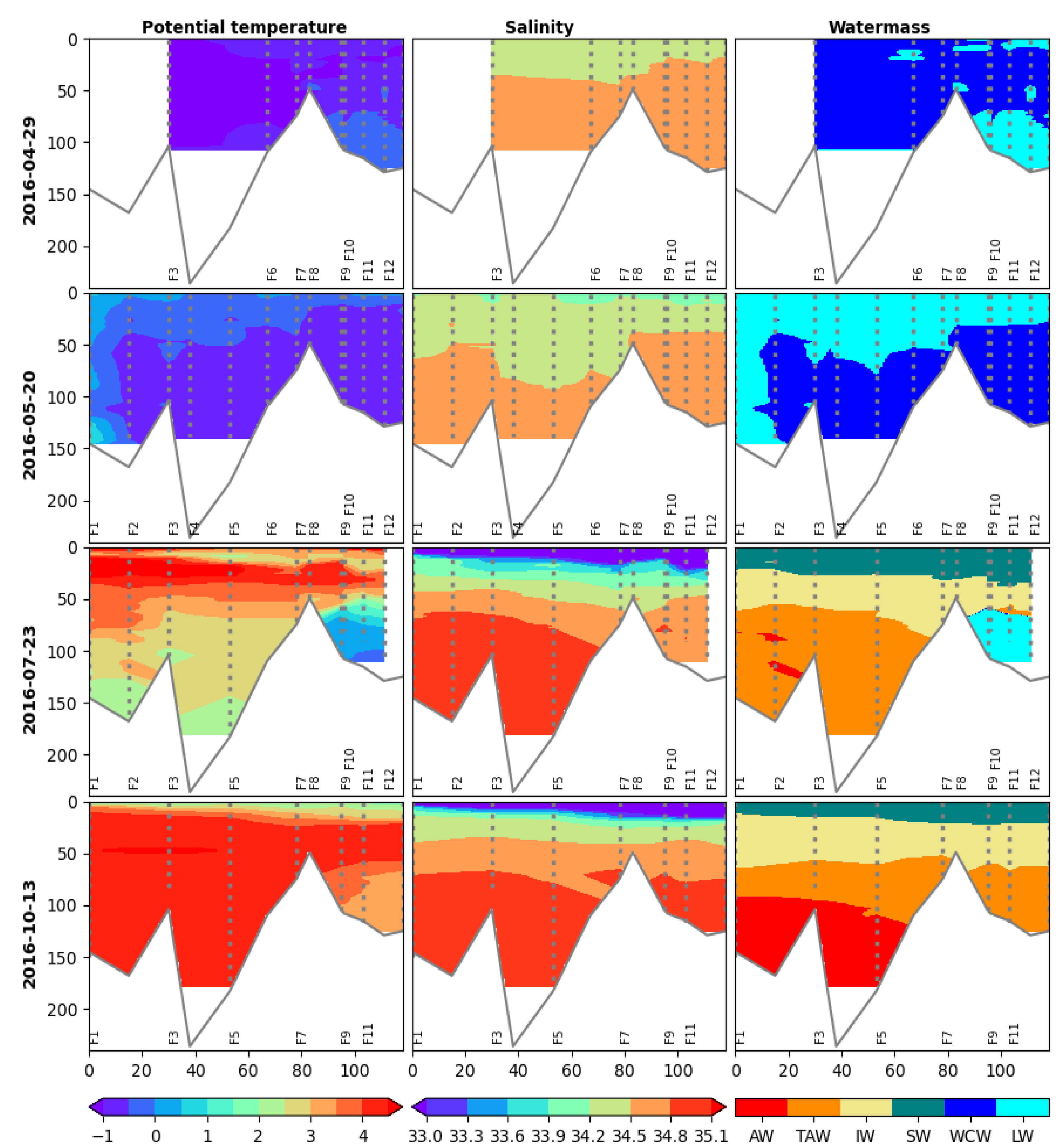


**Fig 2: Interannual variability**

Interpolated potential temperature (left), salinity (middle) and watermasses (right) at the longitudinal section marked in Fig 1. Ordinate shows the depth (m) and abscissa shows the distance (km) from station F1. The data are collected within 10 days of the date indicated for each row in the left corner. Data availability in depth and distance is marked by the vertical gray dotted lines in each panel. Data from 5 years is shown.

**Key Feature:**

Significant fraction of AW/TAW observed in August/October months from 2015 to 2019.



**Fig 3: Seasonal variability**

Same as Fig 2, except data is shown only for 2016.

**Key Features:**

- a. Winter Cooled Water (WCW) and Local Water (LW) formed during previous winter season are dominant till May.
- b. AW/ TAW intrusion events from July onward.