

Ongoing observatory activities off shore SW Spitsbergen in 2014-2017 conducted by OGS and CNR (Italy), and international partners

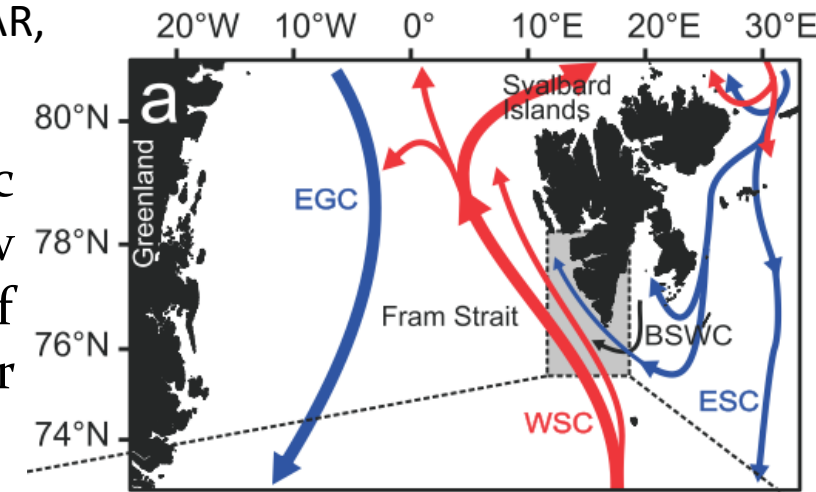


Kovacevic Vedrana and Bensi Manuel (OGS, Trieste, Italy) on behalf of OGS, CNR ISMAR, and international partners (vkovacevic@inogs.it; mbensi@inogs.it)

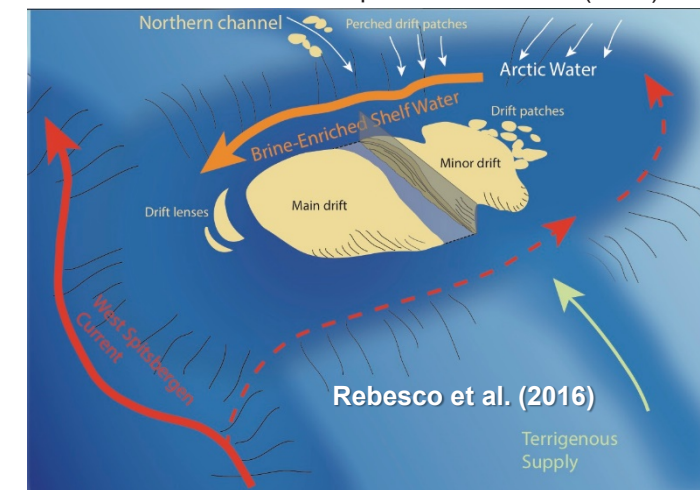
The **offshore SW Svalbard Archipelago** is a region where Atlantic waters, considerably warmer than the locally formed dense waters, flow northwards (West Spitsbergen Current, **WSC**) through the eastern side of the Fram Strait, keeping this area nearly ice-free even during winter season.

Dense waters formed in winter through freezing and brine release in the polynyas of the Barents Sea and particularly in the Storfjorden, flow northwards as density driven currents. Such dense water plumes are also responsible for the accumulation of contourites (e.g. the *Isfjorden and Bellsund contourite drifts*).

From 2014, OGS and CNR-ISMAR, Italy, in collaboration with several international partners have conducted observations in the deep layers of the SW offshore region to study currents and thermohaline variability on multiannual and seasonal scales.



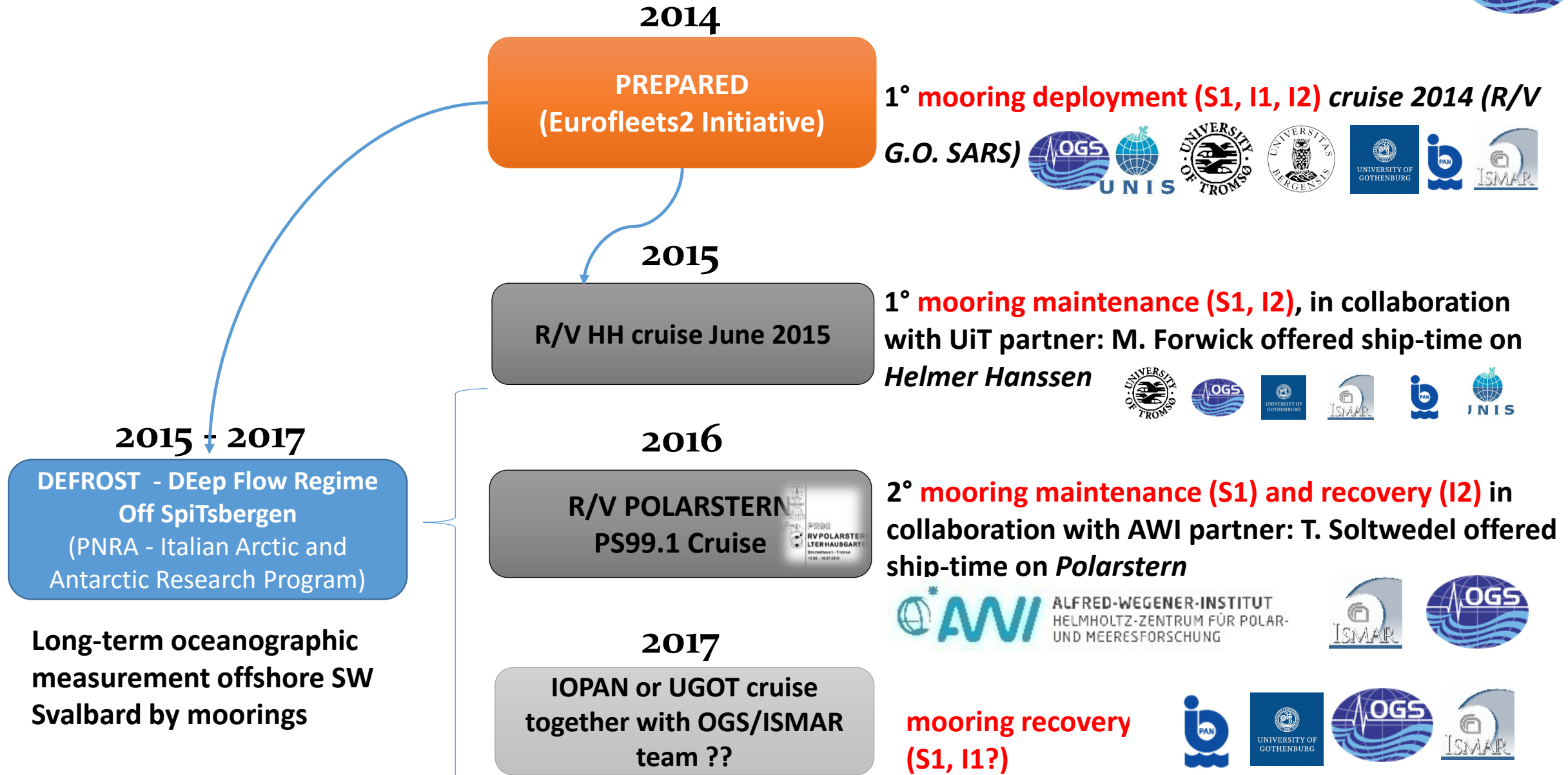
Sanchez-Vidal et al./Deep-Sea Research- I (2015)



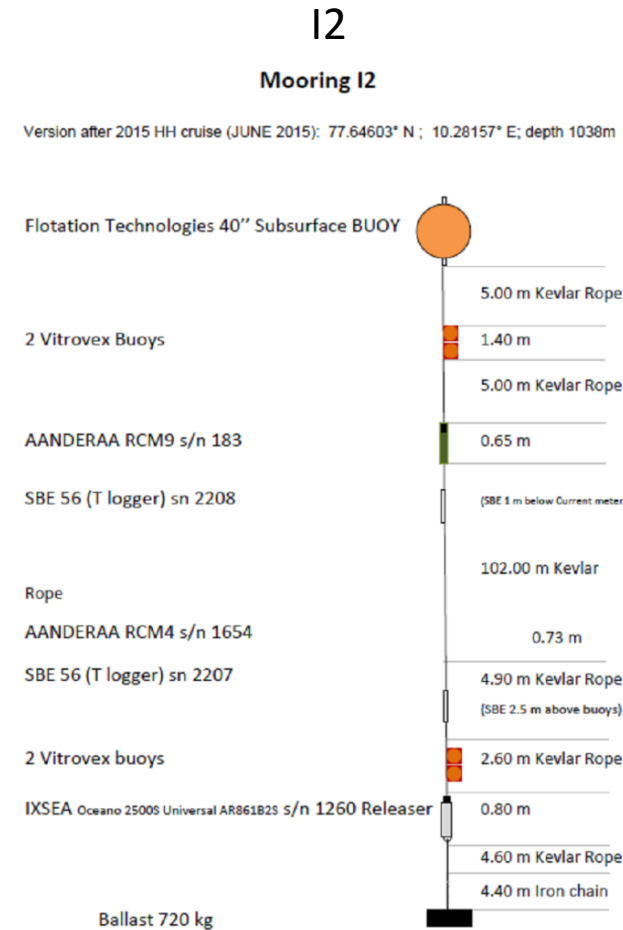
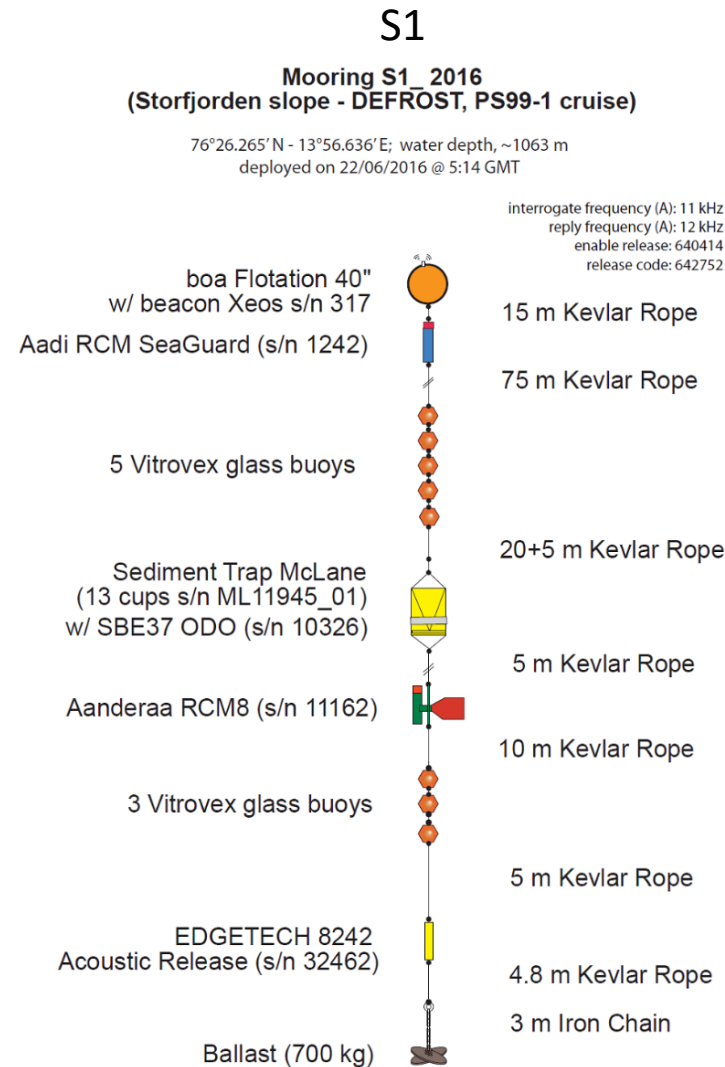
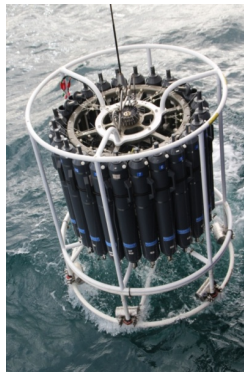
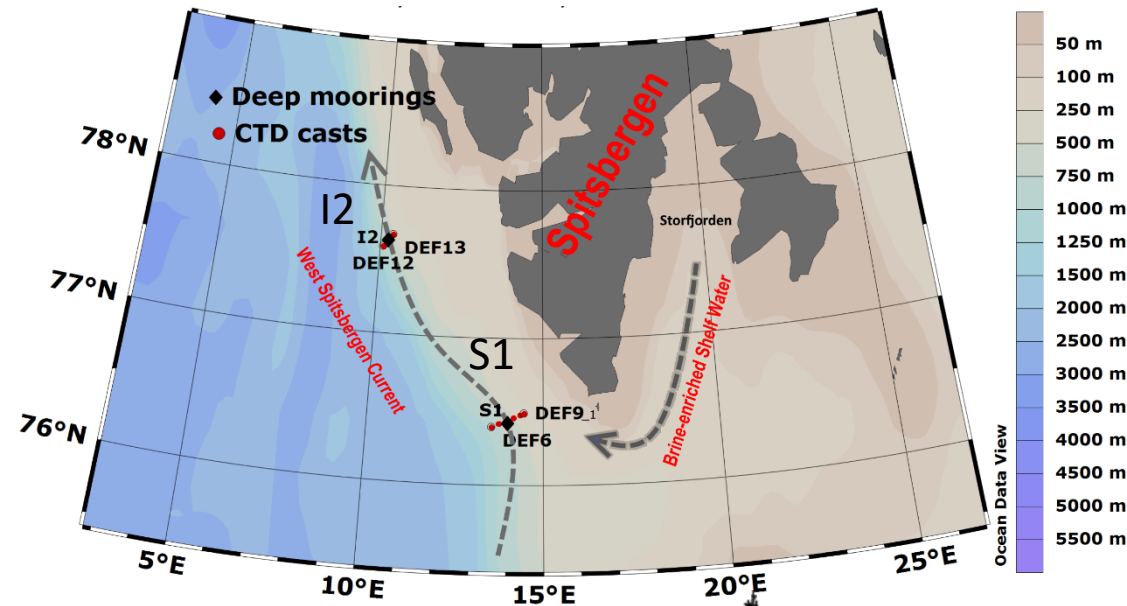
ALFRED-WEGENER-INSTITUT
HELMHOLTZ-ZENTRUM FÜR POLAR-
UND MEERESFORSCHUNG



Brief history of the recent oceanographic activities in the Svalbard region, from 2014 up to now



Results obtained from 2014 up to now



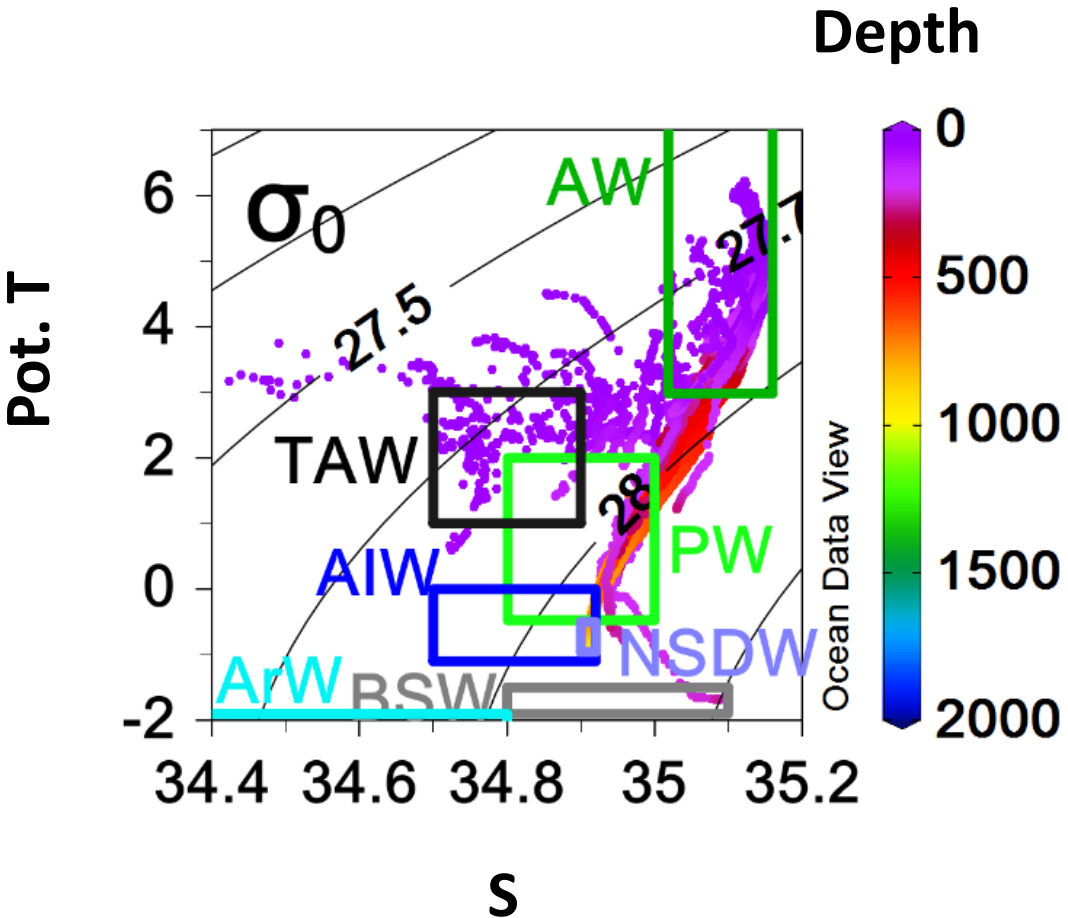
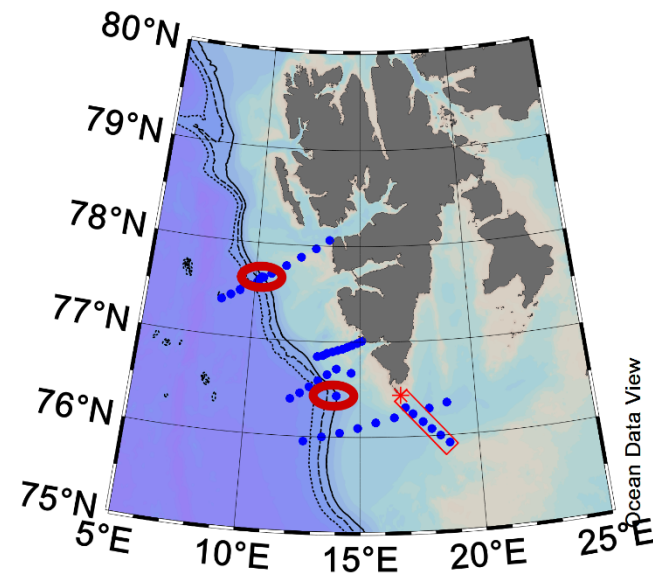
- CTD casts (Temp, Sal, Diss. Oxy, turbidity)
- Water sampling for the following Lab analyses (2014 and 2016): pH (by pHmeter and spectrophotometer), total alkalinity (AT), dissolved oxygen (DO), dissolved inorganic carbon (DIC), hydrogen sulphide (H₂S), carbon dioxide (CO₂), methane (CH₄), dissolved inorganic nutrients and microzooplankton (MZP) abundance and diversity.



PREPARED Cruise Report, 2014

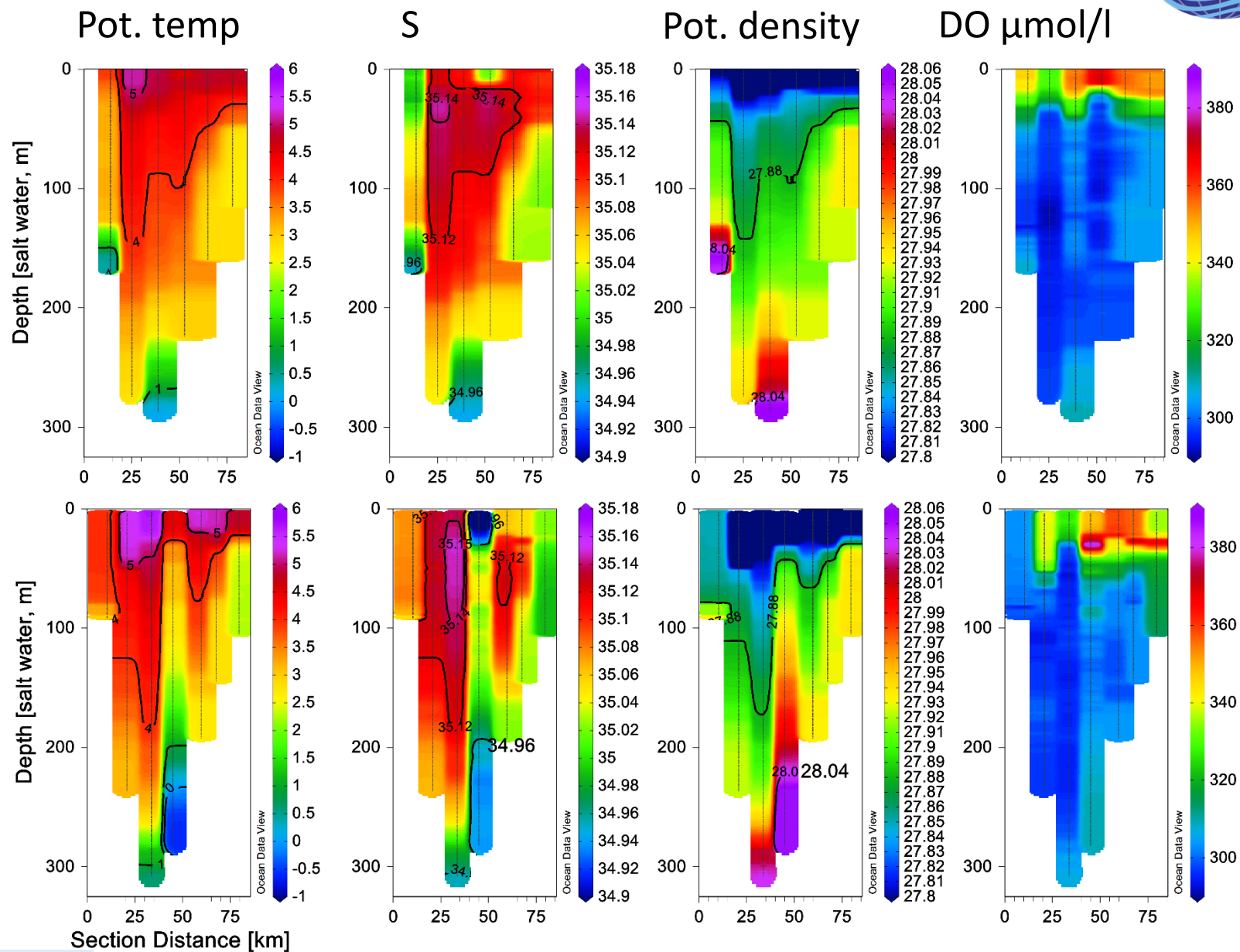
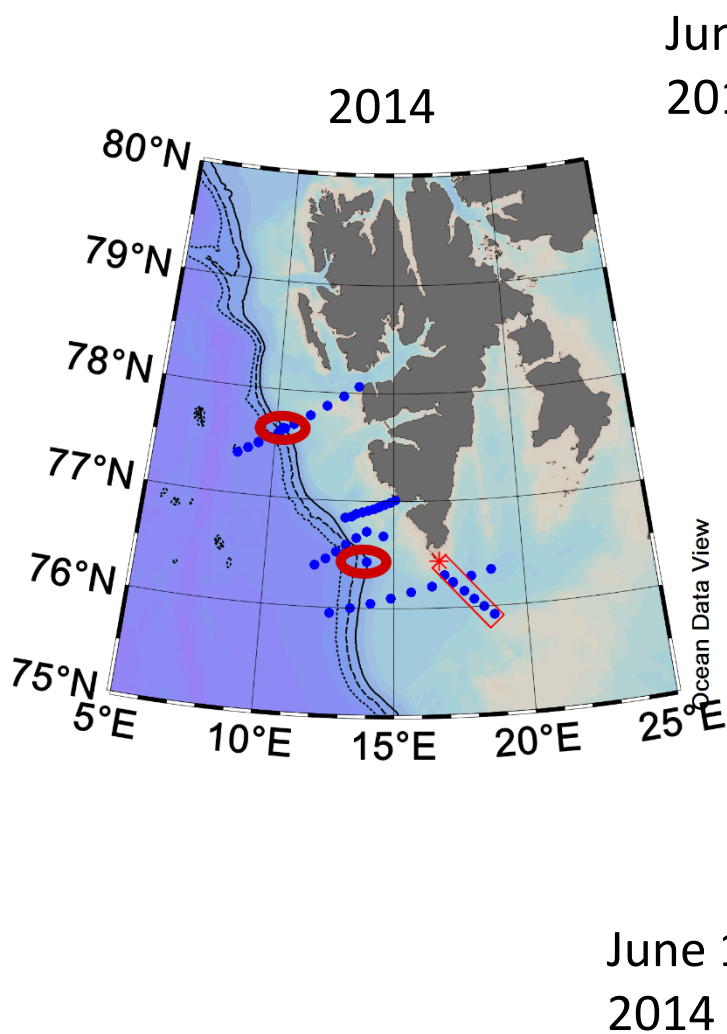
The water masses present in the eastern Fram Strait, the West Spitsbergen Shelf and in Storfjordrenna. From Skogseth et al. (2005), Svendsen et al. (2002), Langehaug and Falck (2012).

Name				Abbreviation	Temperature range [°C]	Salinity range [psu]
Atlantic	Water			AW	>3	>35
Transformed	Atlantic	Water		TAW	1 to 3	34.7 to 34.9
Arctic	Intermediate	Water		AIW	-1.1 to 0	34.7 to 34.92
Norwegian	Sea	Deep	Water	NSDW	-1.1 to -0.5	34.9 to 34.92
Arctic	Water			ArW	<0	34.3 to 34.8
Brine-enriched	Shelf	Water		BSW	<-1.5	>34.8
Polar	front	Water		PW	-0.5 to 2	34.8 to 35
Surface	Water			SW	>0	<34.4



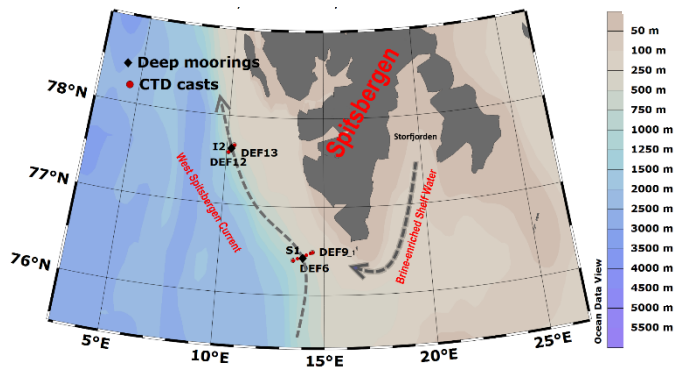
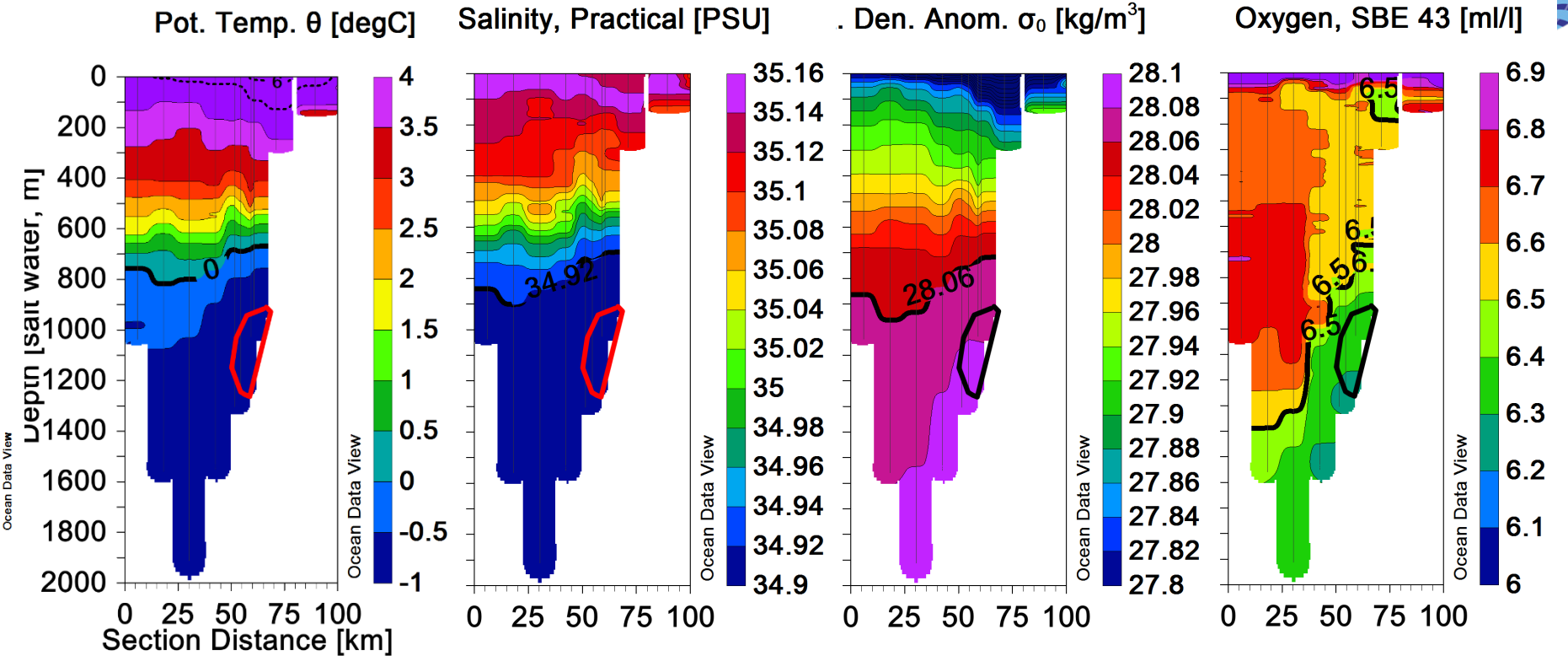
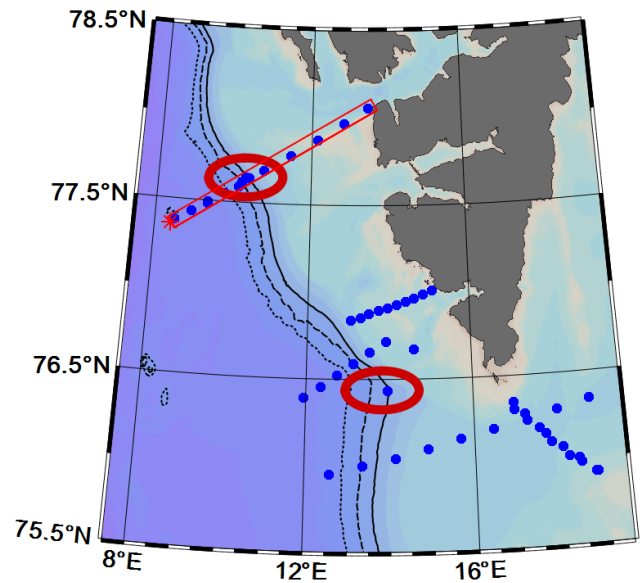


CRUISES – Preliminary results for the thermohaline variability



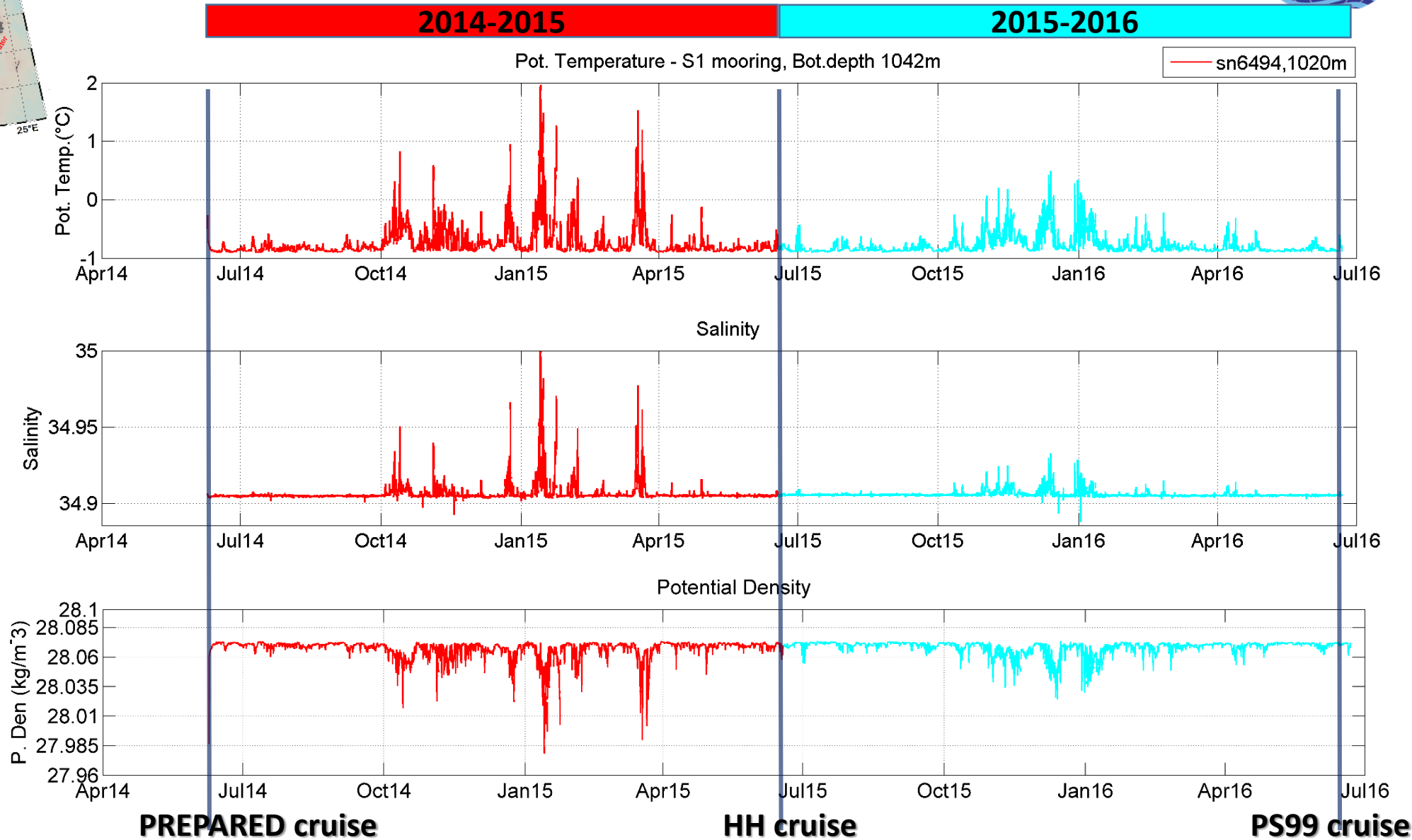
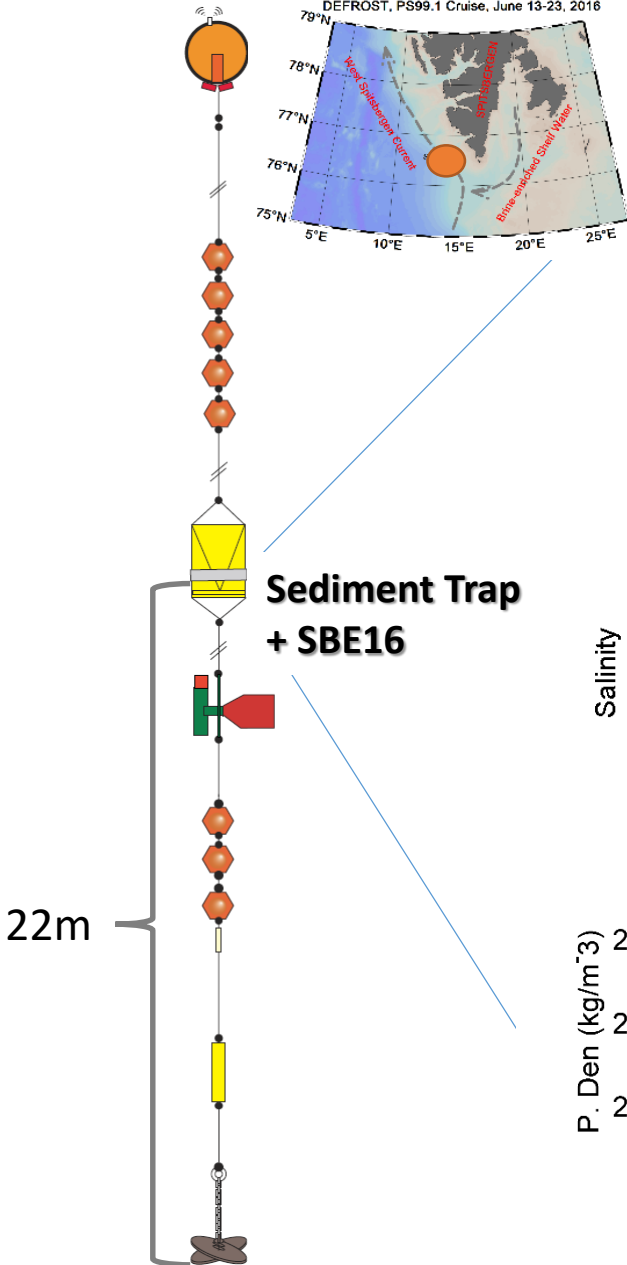


CRUISES – Preliminary results for the thermohaline variability



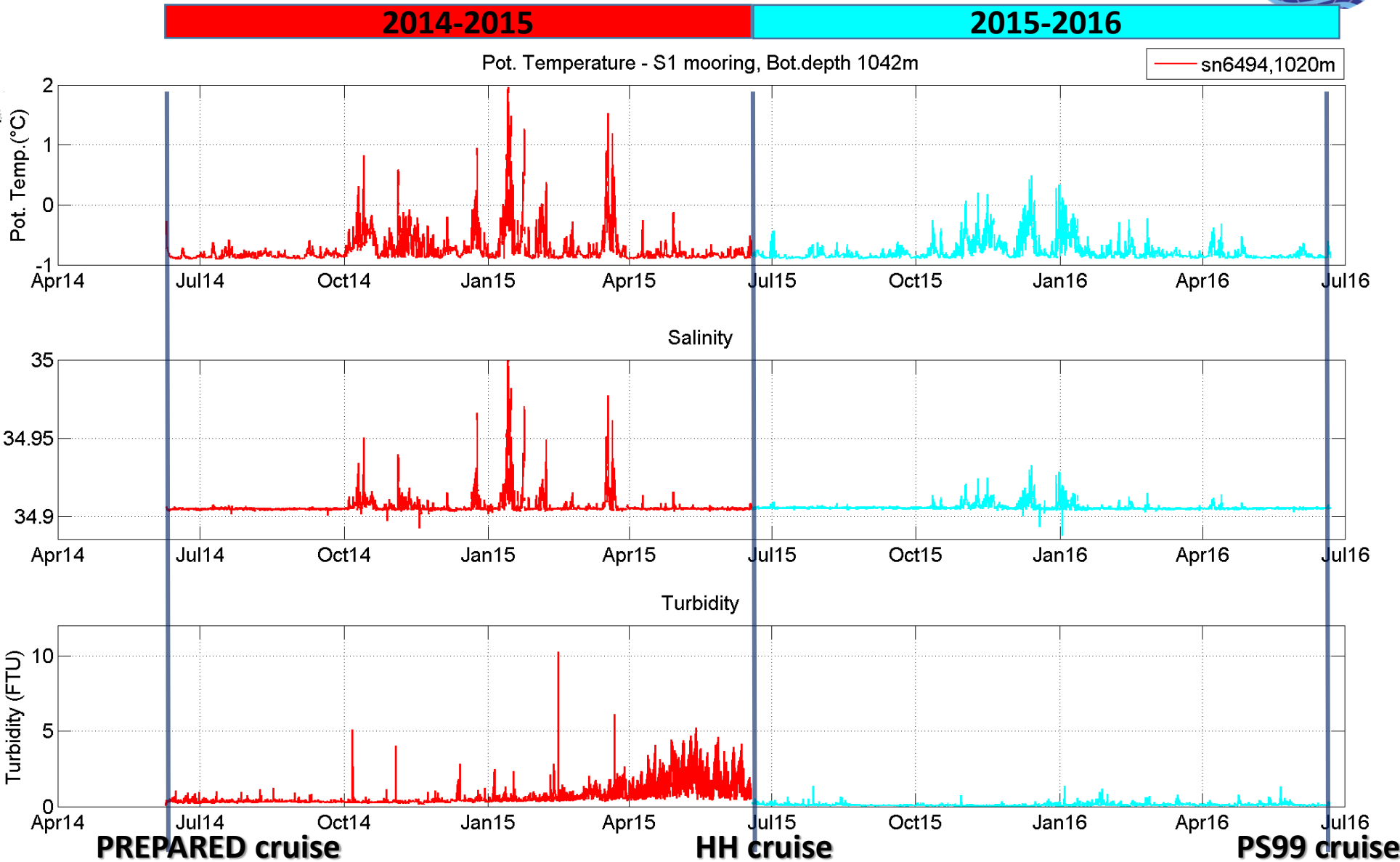
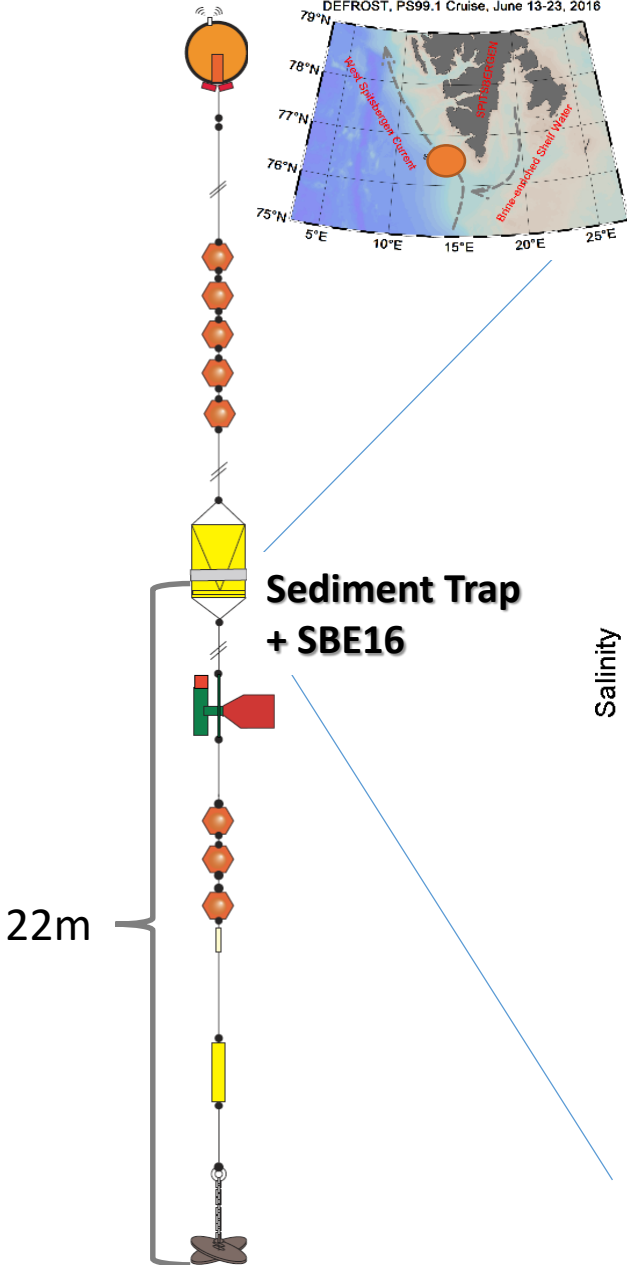


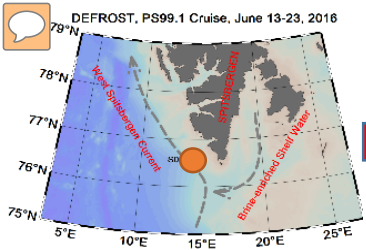
Mooring S1 – Preliminary results for the thermohaline variability





Mooring S1 – Preliminary results for the thermohaline variability

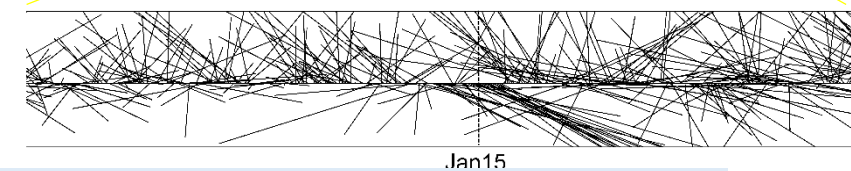
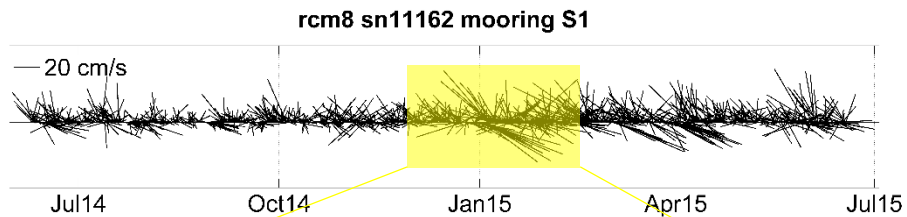
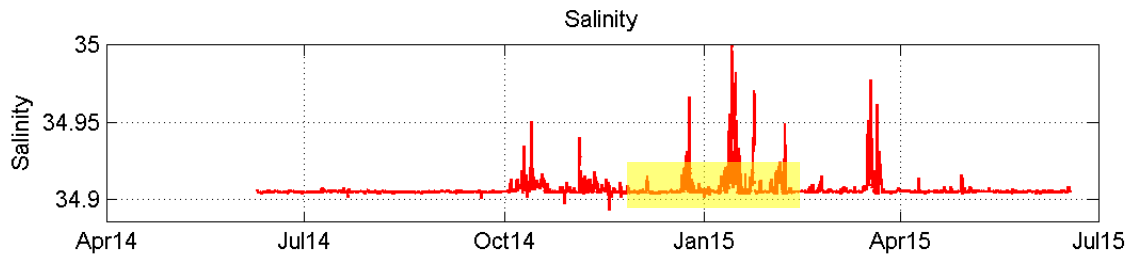
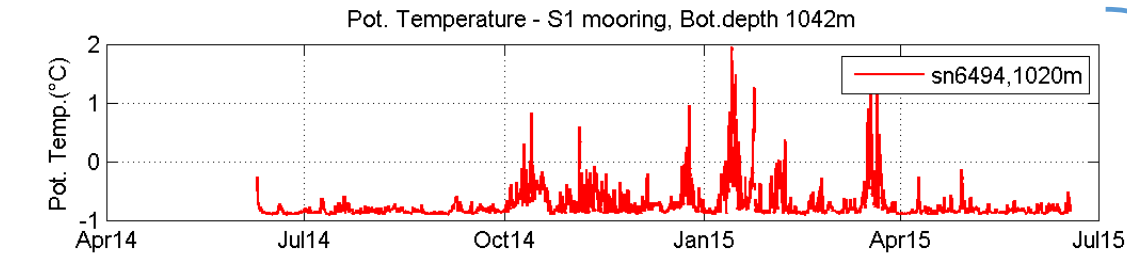




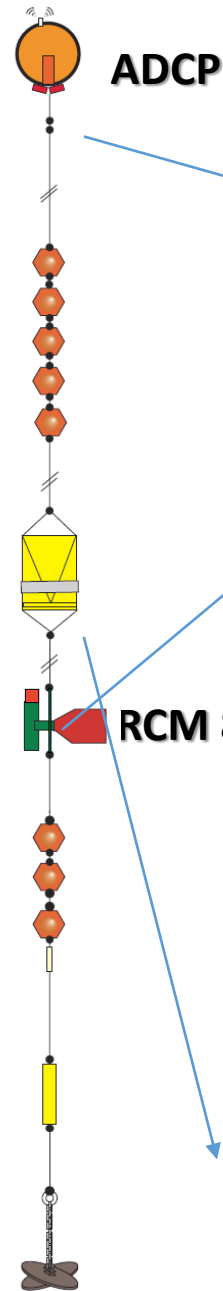
Mooring S1 – Preliminary results for the bottom currents variability



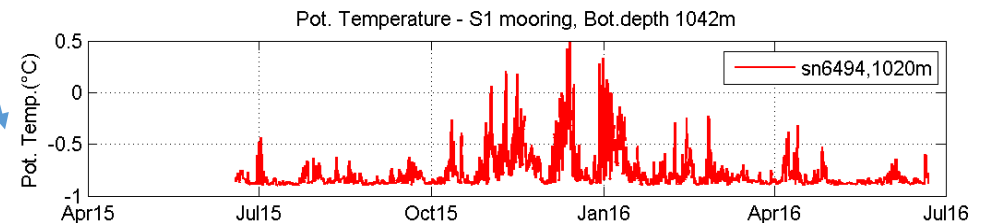
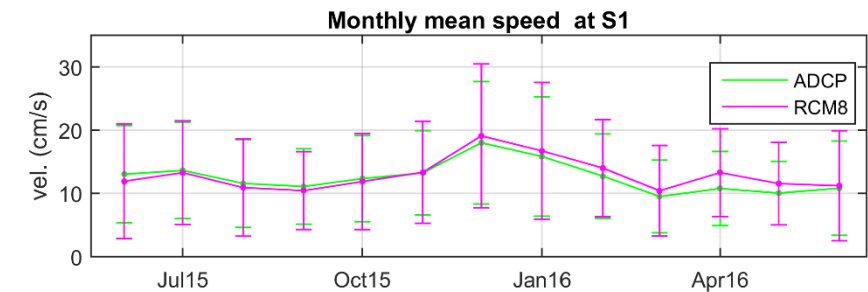
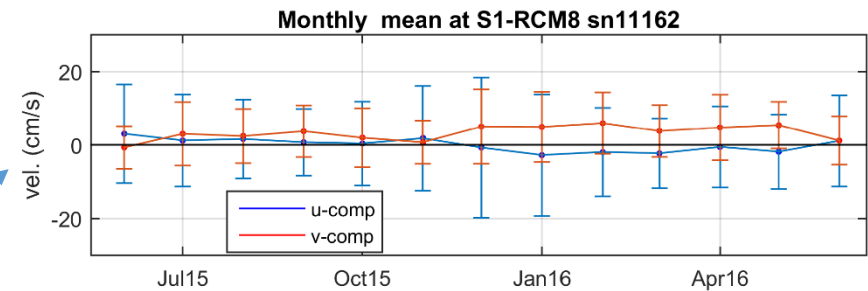
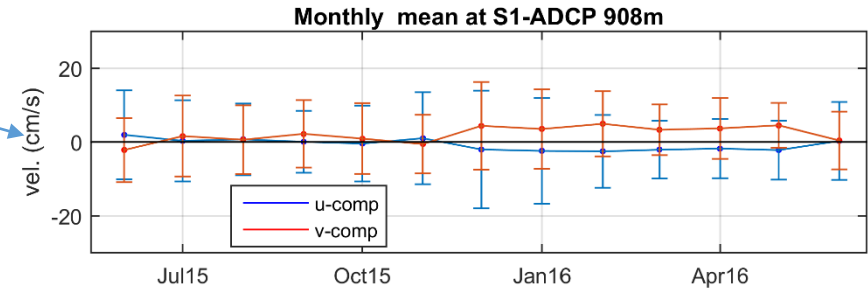
2014-2015 – hourly data

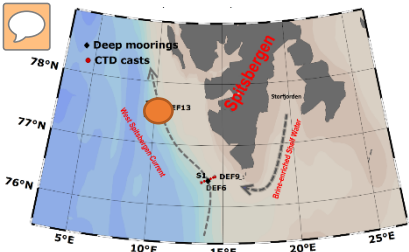


lursella@inogs.it;



2015-2016 – monthly average

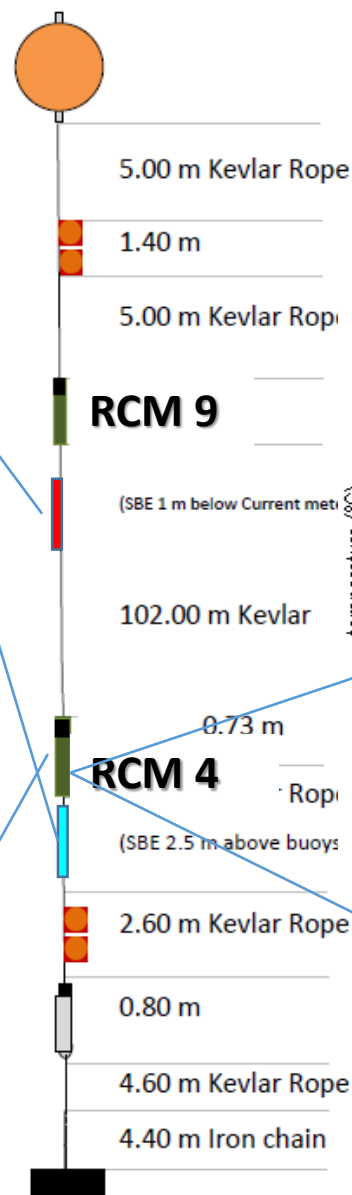
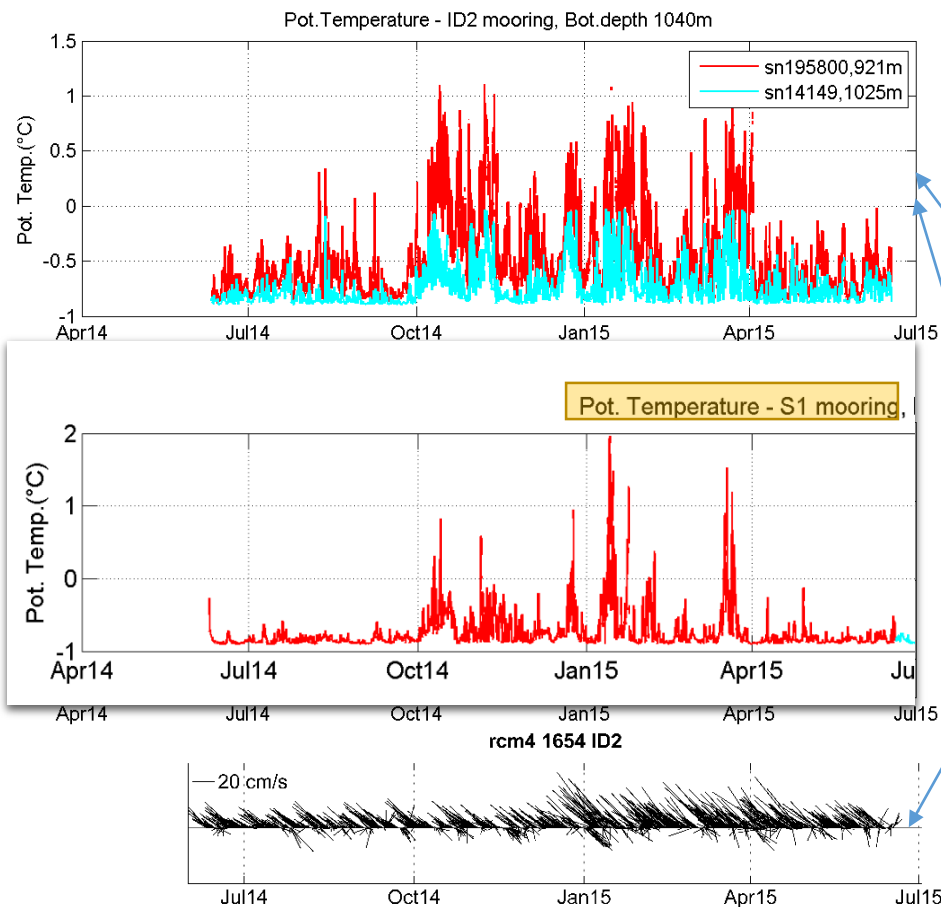




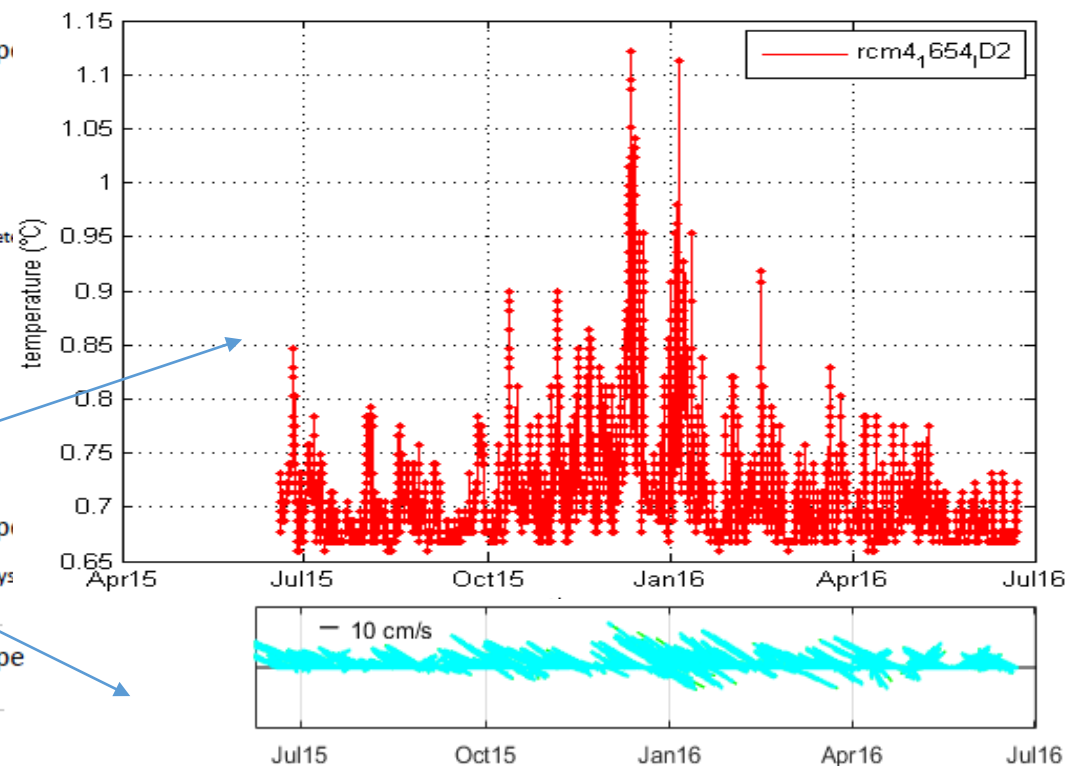
Mooring I2 – Preliminary results for the thermohaline and currents variability

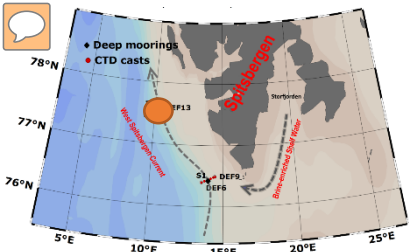


2014-2015



2015-2016

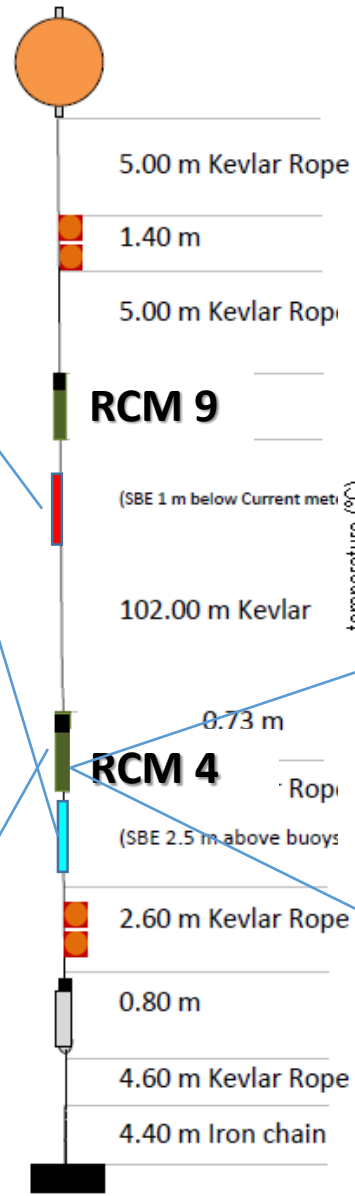
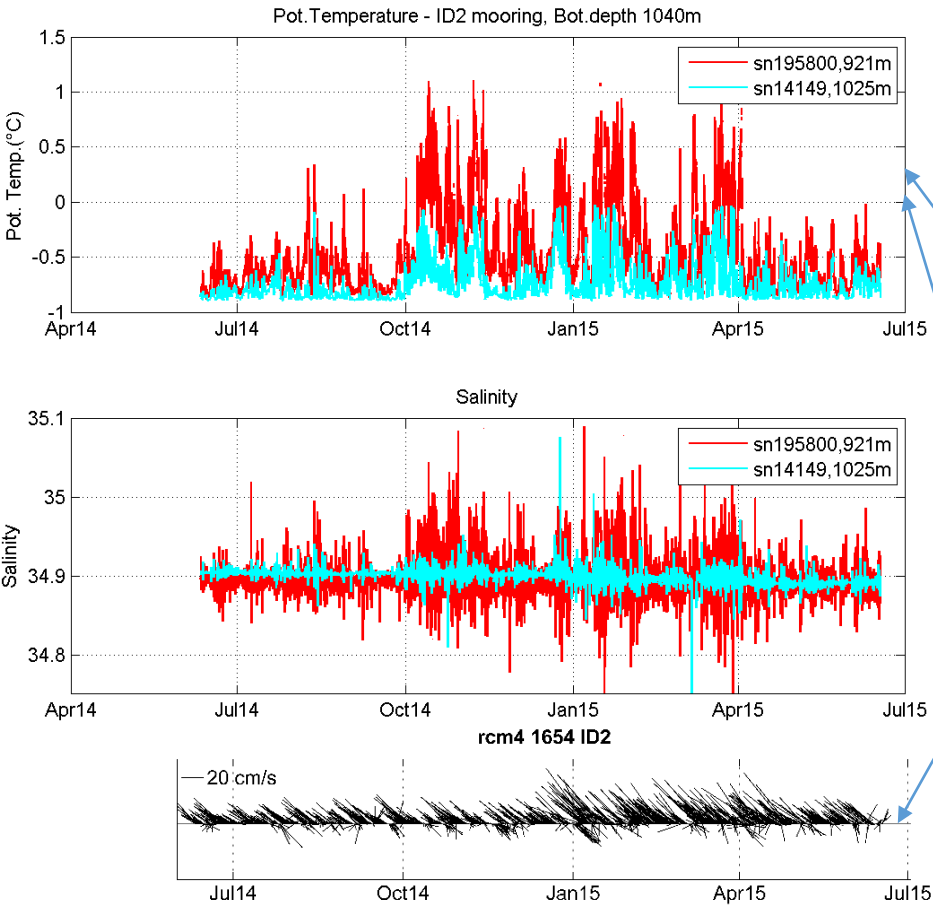




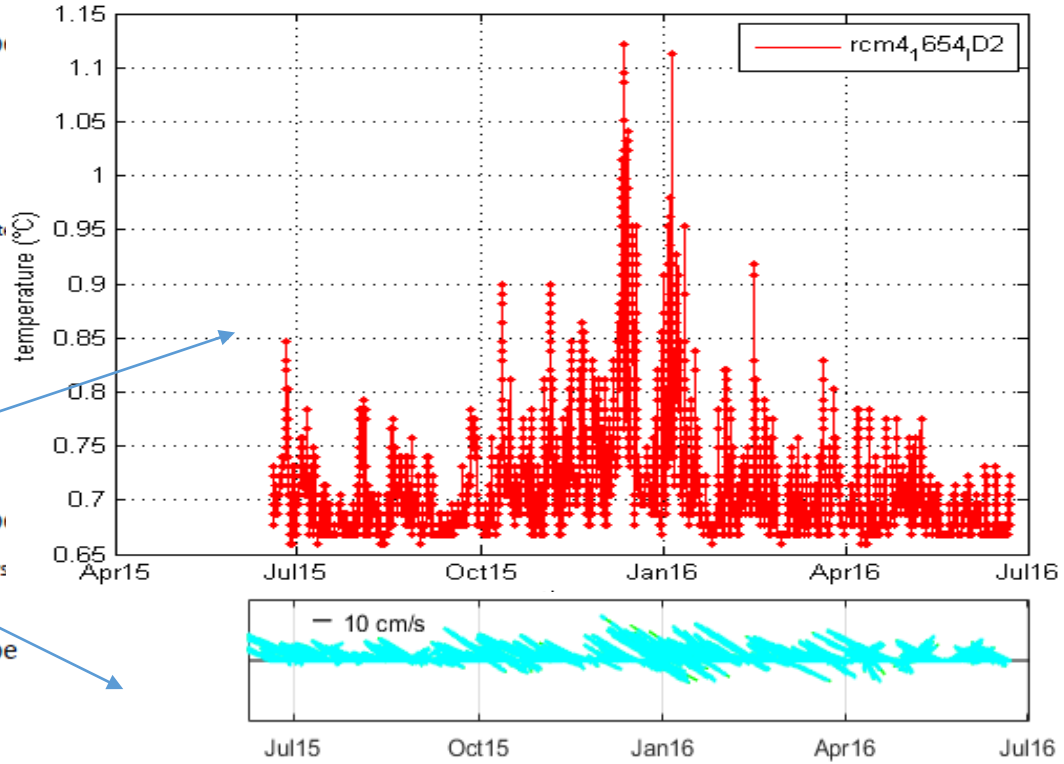
Mooring I2 – Preliminary results for the thermohaline and currents variability



2014-2015

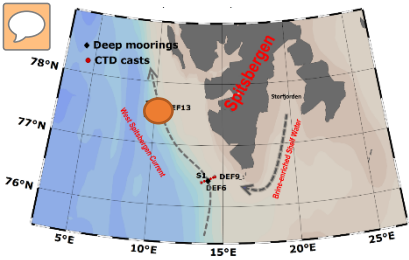


2015-2016

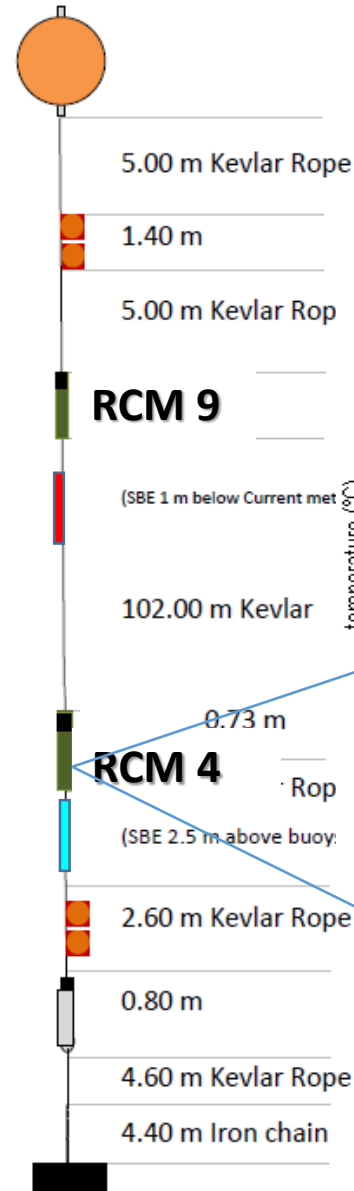
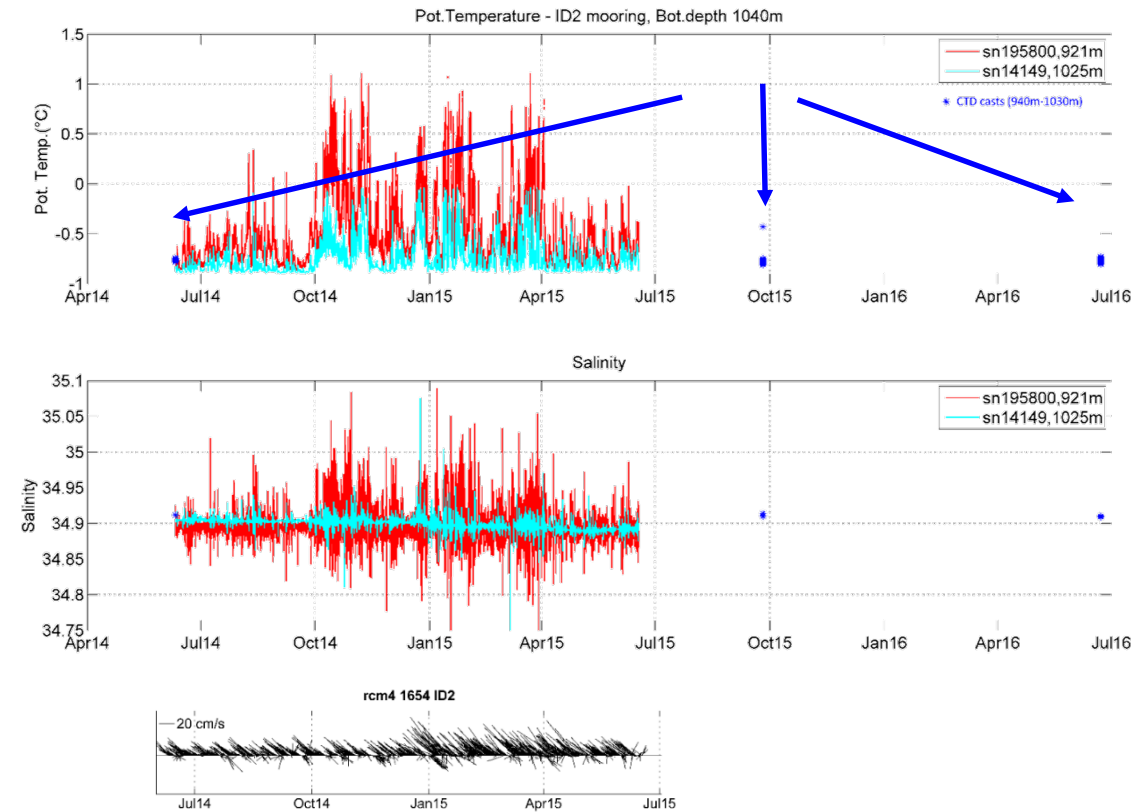




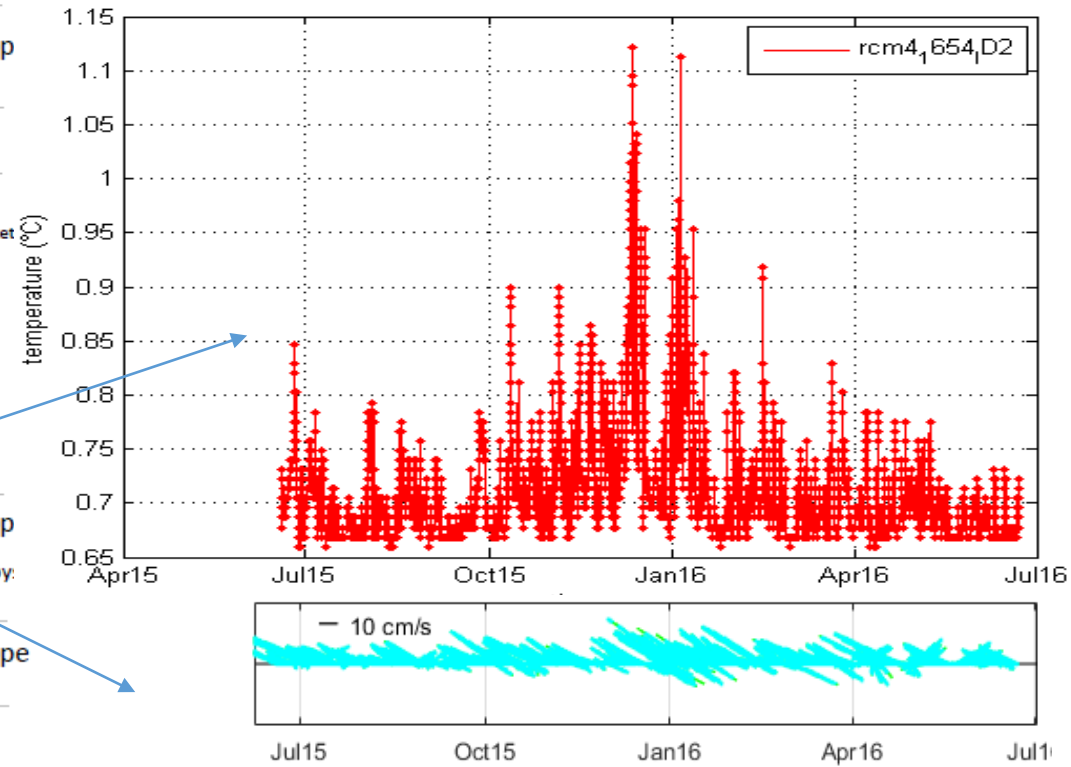
Mooring I2 – Preliminary results for the thermohaline and currents variability



2014-2015



2015-2016



Science:

- 1- Northwards currents and turbidity peaks: are they related to cascading events from the Storfjorden/other shelf areas, even though associated with positives T and S peaks, which means that less dense water injections are captured at the mooring sites, both at S1 and I2 or indicate (modified) AW intrusions?
- 2- What were the meteorological conditions during both winters (2014/2015 and 2015/2016)? And Ice cover?
- 3- Statistical analyses on time series could reveal interesting aspects of the water masses interaction: frequency, time-delays, predominant signals, etc.
- 4- Are there others time series and/or CTD casts from international community that could be used to investigate more in details these phenomena in the period 2014-2016?
- 5- Chemical and biological data need to be analysed with physical ones.

Logistics:

- 1- Ship-time required to retrieve the S1 mooring in summer 2017

Our targets

1- to consolidate a partnership for the summer 2017 recovery of the moorings S1 and I1 (?) on board already established cruises

2- to seek for and strengthen a two-fold collaboration:

- Inviting all of you who are interested to work on the future paper on the time series at S1 and I2 contributing with your own data and your expertise
- Offering of our achievements to integrate/complement within your own on-going research

3- to stimulate and look for those of you who might be interested in collaborating on the extension of the mooring time series in the future or immediately after the summer 2017; our possibilities at this moment are not yet assured