Ocean Sci. Discuss., 12, C1625–C1629, 2016
www.ocean-sci-discuss.net/12/C1625/2016/

Ocean Science
Discussions

Interactive comment on "Seasonal hydrography and surface outflow in a fjord with deep sill: the Reloncavi fjord, Chile" *by* M. I. Castillo et al.

M. I. Castillo et al.

manuel.castillo@uv.cl

Received and published: 13 February 2016

Ans 1 – Ref. #1:

Thanks for your comments, in fact we were aware about the language, me and my co-authors revise the manuscript (MS) and we decide to upload the MS to OSD as it, we wait for the impression of the scientific editor which considers the MS enough readable to be reviewed. The new version of the MS will be checked by AJE (https://www.aje.com/en) after correct the different issues on the English as the reviewer suggest.

Ans 2 – Ref. #1

The salt flux was estimated using both CTD cast and ADCP unfiltered data. The idea

was obtain maximum estimations (indicated on pag. 2547, lines 1-3 of the Reviewed manuscript) of the flux Richardson number (Ri) thus we using CTD cast and ADCP measurements taken almost simultaneously along the fjord.

Despite the 3 m amplitude of the tides on the region, the variability associated to tides is weak specially in the upper 10 m (see Valle-Levinson et al., 2007). In fact, in this layer the variability is less than 10% and tidal currents are minor than 5 cm s-1, here currents typically register intensities of 50 to 70 cm s-1 (see Fig. A1).

The idea was to inform the maximum limit of Ri which enter in the equations of Az and Kz, clearly this is a first approximation and exist several source of variability involve but we consider that these parameters are relevant to be inform, but also we were aware that these estimations must be taken carefully and additional studies it is necessary to aboard the mixing on the fjord (see page 2551, lines 20-21). In fact, future studies on the region might include micro-profiler measurements to measure the mixing directly. Otherwise, the use of maximums of the vertical salt flux might be useful to obtain upper limits for the vertical exchange of salt along the fjord, we will include a phrase indicating that on the new MS.

Ans 3 – Ref. #1

The internal Rossby radii is about 10 km which is not quite longer than the cross-fjord length (3 km) in fact in the cross-fjord momentum balance Coriolis acceleration plays a key role on the subtidal dynamics (see Castillo et al., 2012). The cross-fjord currents are one order minor than the along-fjord currents (Valle-Levinson et al., 2007; Castillo et al., 2012), thus the secondary circulation is weak and the mean profile is nearly to zero intensity. Thus there are not evidences that the cross-fjord currents has any impact on the estimations of the volume flux inform on the MS.

Ans 4 – Ref. #1

The errors +/- indicate standard deviation, the mean values were obtained from rep-

etitions on the 19 along-fjord stations in each sub-basins (there are four sub-basins). Although in depth the fjord present large changes in salinity and temperature (because the strong stratification), along-fjord changes are small into the defined layers and even into the same season (Fig. A2), most of these seasonal variability is in the upper layer (< 5 m depth). We will incorporate a phrase indicating that the error are standard deviation in the new MS.

Ans 5 – Ref. #1

As the Reviewer indicate the Oxygen and Chl-a was described on the MS, we are completely agree with the observation that both needs to be properly addressed on the Discussion section. We incorporate on the new version Discussion and comparison with other regions, we also propose an explanation about the DO seasonal variability but for Chl-a, we speculate only the possible biological/ecological implications based on previous work on the region as Montero et al (2011). In the case of the Oxygen saturation, we estimated that percentages from the in-situ measurements as the Reviewer indicate, we add a phrase on the new version of the MS to highlight that.

Ans 6 – Ref. #1

The sentence on page 2546, was changed accordingly with the Reviewer observation.

Interactive comment on Ocean Sci. Discuss., 12, 2535, 2015.

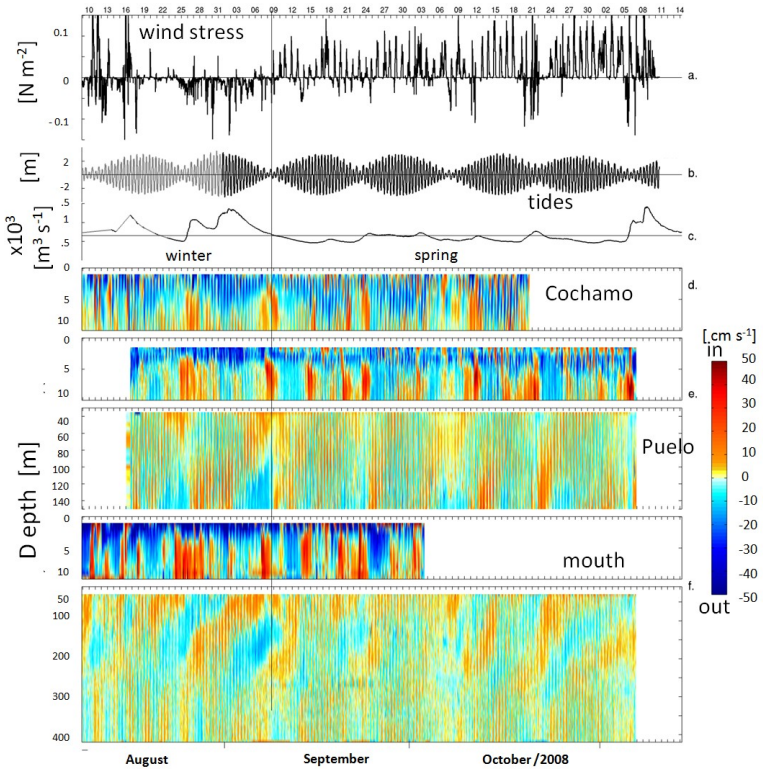

Fig. 1.

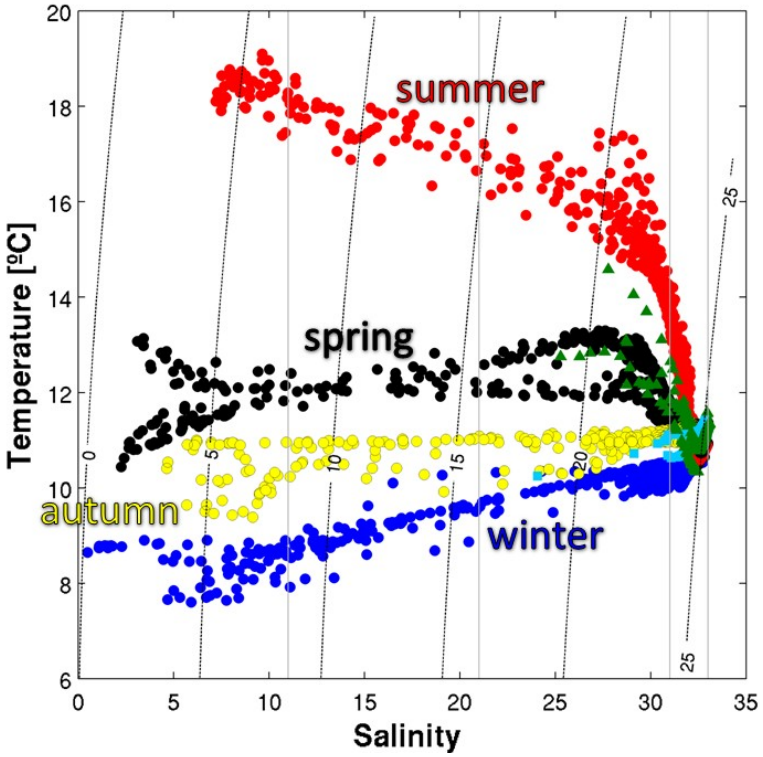
summer
spring
autumn
winter
Temperature [ºC]
Salinity
0
5
10
15
20
25
25
25

Fig. 2.