Nitrate to silicate ratio variability and the composition of micro-phytoplankton blooms in the inner-fjord of Seno Ballena (Strait of Magellan, 54°S)

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The along-fjord variability of nitrate and dissolved silicate was studied in a silled fjord, Seno Ballena, in the Strait of Magellan during flood and ebb tidal phases in December 2007. The spatial and temporal variability of both nitrate and dissolved silicate were consistent with the dynamics of a tidal intrusion front previously described for this fjord by Valle-Levinson et al. (2006). During flood, maximum nitrate values were found seaward and close to the sill due to the upwelling of dense, nutrient-rich water by means of Bernoulli aspiration. Conversely, a sharp drop in surface nitrate landward of the sill was consistent with the sinking of saltier, nitrate-rich, dissolved silicate-poor upwelled waters under relatively less dense, nitrate-poor, dissolved silicate-rich surface waters after flowing landward over the shallow sill. The waters flooding over the sill were particularly enriched in nitrate but poor in dissolved silicate, (NO_3^-:$Si(OH)_4$ ratio ~5). The ratio tended to decrea