



Hydrodynamic control of phytoplankton size-structure and plankton metabolism in the Ría de Vigo (NW Spain)

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The Ría de Vigo (NW Spain) is a temperate coastal embayment profoundly influenced by seasonal irradiance and contrasting atmospheric conditions along the year, which determines the phytoplankton community composition and productivity in the water column. We have characterized the variability of phytoplankton biomass and size structure, along with metabolic rates (both production and respiration) as well as the hydrography of the photic zone in the Ría de Vigo, with twice monthly resolution during a complete year (May 2012 to May 2013). Wide ranges of all the variables were observed in relation to seasonal and short-term variability of physical forcing along our study. For example, Chl *a* ranged from the 191 mg Chl *a* / m² of September, to the 11 mg Chl *a* / m² of February. Net Community Production was highest during September, with 742 mmol O₂/ m² day, and lowest during late November, with -5 mmol O₂/ m² day. Whereas Dark Community Respiration was more intense during June to August, with 116 mmol O₂/ m² day and dropped during winter: 67 mmol O₂/ m² day. Thus, we explore time-dependent relationships between trophic functioning and structure, and its relationship with hydrodynamic variability. This information can improve and update our estimation of the variability and annual balance of plankton metabolism at this productive coastal embayment.