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Spatio-temporal variability of the dissolved organic carbon and nitrogen in a coastal area affected by river input: the north-eastern shelf of the Gulf of Cádiz (southwest Iberian Peninsula)

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Four surveys (June and November 2006; February and May 2007), were carried out in the north-eastern shelf of the Gulf of Cádiz (southwest Iberian Peninsula) in order to investigate dissolved organic carbon (DOC) and dissolved organic nitrogen (DON) dynamics in a coastal area affected mainly by river input, but also by primary production/respiration, resuspension from the sediments and mixing. During the present study DOC ranged from 42 to 198 μM while DON ranged from 0 to 20 μM. The seasonal variations showed high mean surface concentrations of DOC (106.9$\pm$23.4 μM-C) and DON (8.6$\pm$2.9 μM-N) in May, shifting to low DOC (90.3$\pm$26.3 μM-C) and DON (4.8$\pm$3.2 μM-N) in February. For spring, phytoplankton DOC and DON release was likely to be the most significant source of organic matter. Low DOC and DON concentration during winter was likely to be due to the uptake of DOC and DON by bacteria and strong mixing of the water column. The spatial variations showed the highest mean concentrations of DOC (109.1$\pm$27.0 μM-C) and DON (7.3$\pm$2.7 μM-N) in the lower estuary of Guadalquivir Estuary and the lowest mean concentrations of DOC (87.1$\pm$25.5 μM-C) and DON (6.0$\pm$2.9 μM-N) in the bottom water of the distal zone. Highest mean DOC and DON concentration measured off Guadalquivir Estuary may be due to river input and/or resuspension of the organic matter from the bottom sediments. Lowest mean DOC and DON concentration measured in the bottom water of the continental shelf may be due to mineralization and surplus of more refractory organic carbon.