Net production modelling of phytobenthos : integration on a section of garonne river according to the season

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Abstrak

The analysis of daily curves of dissolved oxygen in the Garonne, downstream of Toulouse, shows that the river is generally heterotrophic. It appears in contradiction with the fact that the river bed is covered with a thick periphytic biofilm. From the data obtained in-vitro and in-situ, we developed a model to calculate the net production, integrated over the section. This model makes it possible to simulate various environmental situations: variations of the wet cross section, seasons and turbidity. The simulations show that some zones of the section are highly productive. For the majority of the cases, the daily balance photosynthesis/respiration remains less than one. This negative daily balance is equilibrated by the re-aeration rate associated with the turbulent flow of the Garonne. This work shows, however, that the oxygen level in the river is strongly dependent on the total rate of respiration, so that a weak increase (pollution for example) could quickly induce a reduction in the dissolved oxygen