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| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  |  Dissolved Oxygen **(DO)** With the exception of some anaerobic bacteria, all life forms are dependent upon a source of oxygen gas. Aquatic organisms acquire their oxygen dissolved in water. The level of dissolved oxygen in the water can be an indicator of the primary productivity of an aquatic habitat as well as the level of water quality. As algae and plants carry out photosynthesis they release oxygen gas (O2) into the water. A stable and diverse mixture of producers and consumers would should reveal favorable DO levels.  As dissolved oxygen levels in water drop below 5 mg/L, aquatic life is put under stress. Colder water fish (trout) need levels above 6, and DO above 7 mg/L may be required for spawning. Warm water fish can probably tolerate levels as low as 4. The lower the concentration, the greater the stress. Oxygen levels that remain below 1-2 mg/l for a few hours can result in large fish kills.  Lower water temperatures, larger amounts of turbulence, shallower water, and increased photosynthetic activity by plants all contribute to an increase in DO levels. Higher temperatures, slower moving or deeper water, and increased rates of decomposition all contribute to lower DO levels. High dissolved oxygen levels supports greater diversity of organisms in aquatic systems. Students testing for DO levels also record the [water temperature](http://docs.google.com/temp.html) and [rate of flow](http://docs.google.com/flow_rate.html). In those circumstances when deep pools are studied, the depth at which the sample is taken would also be recorded.  In the table below are some typical DO measurements taken at the Arroyo Del Valle as well as what 100% saturation of DO would be at the given temperature. With the exception of extreme flow rate, DO in the Arroyo has consistently been below 100% saturation.  We had been using LaMotte's snap off DO viles (upper right) until the Fall of 2007 when we then started using [Vernier LabPro](http://www.vernier.com/) equipped with a [DO sensitive probe](http://www2.vernier.com/booklets/do-bta.pdf) (below left) which is connected to a laptop running [Logger Pro Software](http://www.vernier.com/soft/). Both methods of collection are very easy to use and provide accurate enough readings for establishing a baseline needed for comparison purposes.   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  | |  |  |  |  | | --- | --- | --- | --- | | mg/l | temp | flow cm/sec | 100% mg/l | | 5 | 19C | 0.0 cm/sec | 9.4 | | 5 | 21C | 5.0cm/sec | 9.0 | | 5 | 21 | 6.5 cm/sec | 9.0 | | 6 | 20 | 9.0 cm/sec | 9.2 | | 6 | 21 | 15 cm/sec | 9.0 | | 6 | 21 | 20 cm/sec | 9.0 | | 6 | 22 | 20 cm/sec | 8.9 | | 7 | 19 | 25 cm/sec | 9.4 | | 8 | 20 | 30 cm/sec | 9.2 | | 8 | 22 | 50 cm/sec | 8.9 | | 10 | 18 | 175 cm/sec | 9.6 | |  |  | | --- | | Copyright © 2008 Amador Valley High. All Rights Reserved. Reproduction in whole or in part in any form or medium without express written permission of Amador Valley is prohibited. | |