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Establishing a Model Relating Non-Destructive Measurements of Growth to Biomass

Calculating aquatic macroinvertebrate biomass and growth rate is essential to understanding a multitude of ecological questions. Non-destructive methods of measuring growth are needed for long-term and continuous measurements. We compared three standard methods for quantifying organismal growth in order to determine the quantitative relationship between volumetric displacement (VD), body length, and ash-free dry mass (AFDM). AFDM measurements, although the most precise measurement of body size, require killing the organism, whereas VD and body length can be used with live organisms, and continuous growth rates for each individual could be calculated. 45 Salmonfly larva (Pteronarcys californica) were collected at three sites along the Gallatin River in southwestern Montana. Through direct measurements, statistical calculations, and by establishing a model relating non-destructive measurements of growth to biomass, future studies will be able to accurately record growth of the same individual over time, rather than reducing population numbers and diversity.

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