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Sedimentation in Rio La Venta Canyon
in Netzahualcoyotl Reservoir,
Chiapas, Mexico

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Sedimentation of Rio La Venta as it enters the Netzahualcoyotl Reservoir in Chiapas, Mexico, threatens a unique part of the aquatic ecosystem. Rio La Venta enters the reservoir via a narrow canyon about 16 km long with spectacular, near-vertical limestone bluffs up to 320 m high and inhabited by the flora and fauna of a pristine tropical forest. Karst terrain underlies most of the Rio La Venta basin in the vicinity of the reservoir, while deeply weathered granitic terrain underlies the Rio Negro basin, and the headwaters of the Rio La Venta to the south. The Rio Negro joins Rio La Venta 3 km downstream of the upper limit of the reservoir and delivers the bulk of the total clastic sediment (mostly sand and finer material). The canyon and much of the contributing basin lie within the Reserva de la Biosfera, Selva El Ocote, administered by the Comision Nacional de Areas Naturales Protegidas, part of the Secretaria de Medioambiente y Recursos Naturales. The Klamath National Forest has cooperated with its Mexican counterparts since 1993 in natural resource management, neo-tropical bird inventories, wildfire management, and more recently in watershed analyses.

Rates of sedimentation are estimated from bathymetric surveys conducted in March, 2002. A longitudinal profile down the inundated canyon during a high reservoir level shows an inflection from a slope of 0.0017 to one of 0.0075 at 7.2 km downstream of the mouth of Rio Negro. The bed elevation at this point corresponds to the lowest reservoir level, suggesting that the gentler sloping bed upstream is formed by fluvial processes during drawdown and that downstream by pluvial processes. Using accounts that boats could access Rio Negro during low water levels in 1984, we estimate an annual sedimentation rate of roughly 3 million cubic meters per year. This suggests that boats might no longer be able to access the most spectacular section of canyon upstream of Rio Negro within a decade, depending on how the depositional profile develops. Additionally, canyon filling will change the aquatic ecology of the river and the reservoir, and result in loss of fish habitat. A monitoring program is in place to answer this critical question.