Threemile Creek, Grangeville, ID: Simulation of Natural Background Temperature

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Threemile Creek receives wastewater effluent from the Grangeville, Idaho sewage treatment plant (STP). This study uses to modeling to identify the stream temperature immediately upstream of the Grangeville STP outfall that would occur under natural background conditions. A model that simulates all of the heat exchange processes is needed identify the natural background stream temperature under system potential shade.

The QUAL2Kw model was used to simulate water temperatures for this study. Model scenarios for calibration included May 15, 2010 to represent the salmonid spawning critical period and higher streamflows and August 15, 2010 to represent the cold water aquatic life critical period and baseflow conditions. The model results for system potential shade in May showed that natural background stream temperatures would not exceed the 13 degrees C maximum water quality criterion but would exceed the 9 degrees C mean criterion in support of salmonid spawning. The peak maximum prediction is 11.9 degrees C and the peak mean prediction is 10.1 degrees C. The model results for system potential shade in August showed that predicted natural background stream temperatures would not exceed the temperature criteria for cold water aquatic life, averaging 4 degrees C less than existing stream temperatures.