

Water Quality Standards Temperature Criteria for Fresh Water Uses



Fact Sheet

BACKGROUND

The Alaska Department of Environmental Conservation (DEC) is considering temperature criteria for fresh water uses as an issue for potential rulemaking during the 2018-2020 Triennial Review process. Alaska's water quality criteria for temperature (freshwater) are listed in 18 AAC 70.020(10). The criteria are biologically-based as the values are designed to be protective of aquatic life (especially salmonids as sensitive species) during specific life stages. The criteria were first recommended by the EPA in 1977 and adopted by Alaska in 1979.

Determining whether variation in water temperatures is the result of natural causes rather than being affected by human actions can be a challenge, as each of Alaska's waters are unique in their physical and chemical characteristics. DEC can facilitate this by establishing explicit duration and frequency policies that consider natural diurnal and seasonal variation, and site-specific characteristics that may affect the distribution of stream temperatures.

Establishing a Thermal Assessment Duration Period: In 2003 EPA Region 10 issued updated freshwater temperature guidance. The guidance recommends adoption of the seven day average of daily maximums (7-DADMax) as a duration value. The 7-DADMax represents the arithmetic average of seven consecutive measures of daily maximum temperatures and reflects an average of maximum temperatures that fish are exposed to over a week-long period but is not overly influenced by the maximum temperature of a single day. The 7-DADMax for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date. Such an approach assumes that acute or chronic conditions occur over longer time frames. Provision of a 7-DADM has the potential to provide a means of better determining temperature values that have an effect on fish and other aquatic life, while allowing for natural diurnal and seasonal variation.

Protection of Cold Waters and Cold Water Refugia: Alaska's current criteria represent the upper biologic limits sensitive aquatic species have to temperature. However, some waterbodies are naturally cooler or have specific locations (i.e., cold spring upwellings) that resident aquatic life have become adapted to or resort to when temperatures become elevated. This presents a question as to whether the existing maximum criteria are protective of the use at various life stages in all waters. DEC may consider the use of narrative language to address the protection of cold water conditions.

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