

TEMPERATURE CRITERIA IMPLEMENTATION

WHAT IS IT - Implementing the new temperature criteria in NPDES permits

WHY - Legal (Clean Water Act, RCW 90.48, WAC 173-201A)

- Director's requirement to immediately implement (November '06)
- Temperature important for salmon recovery

PROCESS

- Review guidance prepared by Mark Hicks (Permit Writers Workgroup)
- Investigate temperature monitoring devices with costs
- Identify temperature reduction processes for small municipalities (Skillings-Connolly 2007)

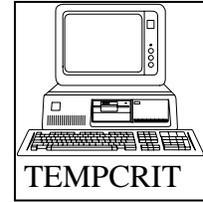
NEXT STEP

- Reasonable potential and limits with sufficient data or monitoring for several years if insufficient data

3.2.6 Temperature

Temperature in the water quality standards is now has multiple criteria and requirements. These include:

1. Annual summer maximum threshold criteria.
2. Supplemental spawning-season criteria.
3. Incremental warming restrictions.
4. Protections against acute effects.
5. Antidegradation requirements.



1. Annual summer maximum threshold criteria. In freshwater, each of 8 categories has a 7 day average daily maximum (7-DADmax) upper temperature limit and a maximum allowable rise. See the table below.

Table 200 (1)(c)

Aquatic Life Temperature Criteria in Fresh Water

Category	Highest 7-DADMax
Char Spawning	9°C (48.2°F)
Char Spawning and Rearing	12°C (53.6°F)
Salmon and Trout Spawning	13°C (55.4°F)
Core Summer Salmonid Habitat	16°C (60.8°F)
Salmonid Spawning, Rearing, and Migration	17.5°C (63.5°F)
Salmonid Rearing and Migration Only	17.5°C (63.5°F)
Non-anadromous Interior Redband Trout	18°C (64.4°F)
Indigenous Warm Water Species	20°C (68°F)

In marine water the categories have a 1 day maximum (1-DMax)

Aquatic Life Temperature Criteria in Marine Water

Category	Highest 1-DMax
<i>Extraordinary quality</i>	13°C (55.4°F)
<i>Excellent quality</i>	16°C (60.8°F)
<i>Good quality</i>	19°C (66.2°F)
<i>Fair quality</i>	22°C (71.6°F)

2. Supplemental spawning-season criteria. In some waters, a second threshold criterion is assigned to protect the spawning and incubation of salmonids (9°C for char and 13°C for salmon and trout) [WAC 173-201A-200(1)(c)(iv), and Ecology publication 06-10-038]. These criteria include explicit date-windows for application, and must be applied in addition to the annual summer maximum criteria discussed above. For fresh water bodies identified in Part VI of the standards the following are applicable:

- Maximum 7-DADMax temperatures of 9°C (48.2°F) at the initiation of spawning and at fry emergence for char; and
 - Maximum 7-DADMax temperatures of 13°C (55.4°F) at the initiation of spawning for salmon and at fry emergence for salmon and trout.
3. Incremental warming restrictions. In addition to the criteria discussed above, the water quality standards limit the amount of warming human sources can cause at any time water temperatures are cooler than the assigned threshold criteria. This criteria is designed to provide protection for the overall temperature regime [See WAC 173-201A-200(1)(c)(ii), 210(1)(c)(ii)].

At any time the background temperature is cooler than the assigned threshold criterion, point sources are permitted to warm the water by only a defined increment, t .

Calculate t as follows:

- $t = 28 / (T_{\text{ambient}} + 7)$ in freshwaters, or
- $t = 12 / (T_{\text{ambient}} - 2)$ in marine waters.

4. Protection against acute effects

- A. Moderately acclimated (16-20°C, or 60.8-68°F) adult and juvenile salmonids will generally be protected from acute lethality resulting from discrete human actions by maintaining the 7-DADMax temperature at or below 22°C (71.6°F) and the 1-day maximum (1-DMax) temperature at or below 23°C (73.4°F).
- B. Lethality to developing fish embryos can be expected to occur at a 1-DMax temperature greater than 17.5°C (63.5°F).
- C. To protect aquatic organisms, discharge plume temperatures must be maintained such that fish could not be entrained (based on plume time of travel) for more than two seconds at temperatures above 33°C (91.4°F) to avoid creating areas that will cause near instantaneous lethality.

5. Antidegradation requirements

- (1) Whenever a water quality constituent is of a higher quality than a criterion designated for that water under this chapter, new or expanded actions within the categories identified in 2 below that are expected to cause a measurable change in the quality of the water (see 3 below) may not be allowed unless the department determines that the lowering of water quality is necessary and in the overriding public interest.
- (2) A Tier II review will only be conducted for new or expanded actions conducted under the following authorizations. Public involvement with the Tier II review will be conducted in accordance with the public involvement processes associated with these actions:
 - (a) National Pollutant Discharge Elimination System (NPDES) waste discharge permits;
 - (b) State waste discharge permits to surface waters;
 - (c) Federal Clean Water Act Section 401 water quality certifications; and
 - (d) Other water pollution control programs authorized, implemented, or administered by the department.

- (3) Definition of measurable change. To determine that a lowering of water quality is necessary and in the overriding public interest, an analysis must be conducted for new or expanded actions when the resulting action has the potential to cause a measurable change in the physical, chemical, or biological quality of a water body. Measurable changes will be determined based on an estimated change in water quality at a point outside the source area, after allowing for mixing consistent with WAC 173-201A-400(7). For temperature, a measurable change includes any temperature increase of 0.3°C or greater at the boundary of the chronic mixing zone. New or expanded actions includes any increase of flow or loading as a result of production increases, increased treatment plant capacity or rerating of treatment plant capacity.