



Focus on **Temperature:** **Water Quality Standards**

from Ecology's Water Quality Program, Watershed Management Section

For More Information:

Contact Mark Hicks at (360) 407-6477.

or, visit our web page at:

www.ecy.wa.gov/programs/wq/swqs

Join the Mailing List

To be added to the water quality standards mailing list, contact Andrew Kolosseus at (360) 407-7543 or send an e-mail to: swqs@ecy.wa.gov

Temperature Rule Language

The fresh water temperature criteria can be found in WAC 173-201A-200(1)(c).

A listing of water bodies can be found in WAC 173-201A-600 and 602.

Why is temperature important for water quality?

Water temperature is an important element for the health and survival of native fish and aquatic communities. Temperature can affect embryonic development, juvenile growth, adult migration, competition with non-native species, and the relative risk and severity of disease.

What are the temperature criteria?

The temperature criteria adopted in July 2003 for rivers and streams are:

Use of Water Body	Highest 7-Day Average of Daily Maximum (7-DADMax) Temperature
Bull Trout and Dolly Varden (Char) Spawning and Early Tributary Rearing (mostly former Class AA water bodies*)	12°C (53.6°F)
Salmon and Trout Spawning, Core Rearing , and Migration (former Class AA and Lake Class water bodies)	16°C (60.8°F)
Salmon and Trout Spawning, Non-Core Rearing , and Migration (former Class A water bodies)	17.5°C (63.5°F)
Salmon and Trout Rearing and Migration Only (former Class B water bodies)	17.5°C (63.5°F)
Non-Anadromous Interior Redband Trout (new category)	18°C (64.4°F)
Indigenous Warm Water Species (new category)	20°C (68°F)

Where do the criteria apply?

The water bodies protected for char and the three salmon and trout categories are described in the water quality standards (WAC 173-201A-600 and 602). Maps are also available on Ecology's web page that show where the char criterion applies.

Currently, there are no water bodies in either the redband trout or warm water species categories. Future rules could add water bodies to these categories.

** Prior to July 2003, water bodies were organized into a system of classes: Class AA, Class A, Class B, and Lake Class. With the adoption of new water quality standards, water bodies are now classified by actual use.*

Spawning and Incubation Criteria

Where Ecology determines that the annual maximum temperature criteria in the table would not protect spawning and incubation, the following criteria apply:

- Maximum 7-DADMax temperatures of 9°C (48.2°F) at the initiation of spawning and at fry emergence for char.
- Maximum 7-DADMax temperatures of 13°C (55.4°F) at the initiation of spawning and at fry emergence for salmon and trout.

Ecology is committed to developing detailed guidance for effectively implementing the narrative spawning criteria. Federal and state fisheries agencies, tribes, and interested stakeholders will be invited to help develop this guidance. Once the guidance is done, Ecology will maintain a list of waters where the single, summer maximum criterion is not sufficient to protect spawning and incubation.

Natural Conditions

Portions of many water bodies cannot meet the criteria due to the natural condition of the water body. The natural condition is the temperature at which a water body would be without any human influences. When a water body does not meet its assigned criteria due to natural conditions, the natural temperature of the water body, plus 0.3°C (0.54°F) for human activity, becomes the alternative criteria target for that water body.

Lakes

Human actions taken together may not increase the 7-DADMax temperature more than 0.3°C (0.54°F) above natural conditions.

How is the 7-DADMax calculated?

The 7-DADMax is the arithmetic average of seven consecutive daily maximum temperature measurements. 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 to, and the three days after, that date.

Ecology strongly encourages the use of monitoring devices that continuously record water temperature and are capable of obtaining the daily maximum temperature necessary to calculate the 7-DADMax.

For the average river, the highest 7-DADMax temperature is about 1°C (1.8°F) cooler than the highest daily maximum temperature.