

General Issue 1: Purpose and Need for Temperature Implementation Policy

Some commenters questioned the need for a Policy to implement the water quality objectives for temperature in the north coast region. These commenters stated that the Regional Water Board (RWB) is already doing the things identified in the proposed Policy, that existing rules and regulations are already adequate, or that extra layers of regulation won't help achieve water quality objectives.

Response:

The proposed Policy identifies existing authorities and processes as the mechanism for implementing the objectives for specific categories of activities. One purpose of this proposed Policy is to identify the activities that pose a risk of elevating water temperatures and describe how the RWB will address those activities to prevent elevated water temperatures. It is appropriate, then, to identify all regulatory mechanisms that apply, including those that are already in place and working, as well as those that are in development.

In 2009, the Sierra Club and several other non-profit environmental groups filed a lawsuit alleging that the RWB violated mandatory duties under the Porter-Cologne Water Quality Control Act, Water Code section 13000 et seq., section 303(d) of the Federal Clean Water Act, 33 U.S.C. section 1313(d), in failing to adopt a program of implementation for total maximum daily loads ("TMDLs") for certain water quality-impaired waterbodies within the North Coast Region of California. Under section 303(d)(2), once EPA approves or issues a TMDL, the state must incorporate the TMDL into its water quality management plan. (Basin Plans are one part of the water quality management plan.) The RWB maintains that it has met all obligations for implementing TMDLs; however, it has not consolidated all of its temperature TMDL implementation efforts into a single document that could serve as an "implementation plan" for meeting the statutory requirements. In 2004 the RWB adopted a Sediment TMDL Implementation Policy which provides for the control of sediment pollution by using existing permitting and enforcement tools. The proposed temperature implementation policy is similar but broader in reflecting the RWB's intent to enforce TMDL requirements through basinwide and regionwide programs where possible.

The proposed Policy resolution has no regulatory effect by itself. It does not create any new layers of permitting. The identified permitting programs that are under development are not being developed as a result of this Policy resolution. This proposed Policy simply directs RWB staff to address temperature concerns while developing those permitting programs.

Some commenters stated that the proposed Policy is not necessary because the Anadromous Salmonid Protection (ASP) rule package recently incorporated into the Forest Practice Rules addresses temperature concerns. First, the proposed Policy comprehensively addresses implementation of the water quality objectives for temperature in the context of any land use, while the Forest Practice Rules only apply to forestry activities. The ASP rule package established riparian protections that are largely consistent with the proposed Policy. However, the enhanced riparian

protections required in the ASP rules only apply to waters where anadromous fish are present, and the 1000 feet of class II waters with water flowing in them on July 15th of a normal year. Thus, the rule package does not address many fish-bearing streams above anadromy (e.g., the Trinity River watershed upstream of Lewiston Dam, the Mad River watershed upstream of Mathews Dam, the Eel River watershed upstream of Cape Horn Dam, The Klamath River watershed upstream of Iron Gate Dam, etc.), nor does it apply to the myriad of perennial stream reaches more than 1000 feet from a fish-bearing stream.

General Issue 2: Proposed Policy is Supported By Science

Many of the comments submitted have asserted that the Resolution is not based on or justified by science. Some commented that there are no scientific studies cited in the Resolution. Other comments suggested that the experimental research conducted by Dr. Cajun James demonstrates that maintaining stream shade is not important for the prevention of elevated water temperatures, or not as important as portrayed in the resolution. Some provided or referred to temperature data collected before and after timber harvest as an indication the proposed Policy is based on false premises. These comments are addressed below.

Response

No studies cited:

The Resolution includes findings that identify 12 TMDL temperature analyses that have been conducted in the North Coast. Detailed information about the studies, including review of pertinent literature, is included in the documentation supporting those TMDLs. Each of the 12 temperature TMDLs cited in the resolution includes an extensive review of literature related to water temperature dynamics and factors that cause elevated water temperatures, as well as a watershed-based scientific assessment of factors responsible for elevated water temperatures. All 12 of the temperature TMDLs were approved by the USEPA. Three of these temperature TMDLs have Action Plans that were adopted by the RWB and amended into the North Coast Region Basin Plan. The TMDLs amended into the Basin Plan went through a scientific peer review as part of the amendment process.

The temperature TMDLs completed in the North Coast Region and the concepts that this Resolution embraces and relies on to implement those TMDLs and future temperature TMDLs (i.e., protection of stream shade, cold water flows, and channel dimensions) are consistent with the state of the science of stream temperature. The RWB staff possess and rely on an extensive library of scientific literature pertinent to water temperature science. The most pertinent of these studies are discussed in the problem statement section of the temperature TMDLs developed to date and cited in this resolution.

Dr. Cajun James' work:

Many comments suggested that the experimental research conducted by Dr. Cajun James refutes the interaction between solar radiation and water temperature. Some commenters stated that her work "showed that ambient air temperature and not stream-side shade alteration caused in-stream temperature increases", and that her study

involved “removing trees providing shade to the watercourse from portions of the watercourse and lake protection zone, in stages, eventually all the way to the streams edge (100% removal of streamside vegetation) and saw no negative measurable in-stream temperature increases from the harvesting activity.” All the comments regarding Dr. James work referenced Dr. James’ Ph.D. dissertation. [Southern Exposure Research Project: A Study Evaluating the Effectiveness of Riparian Buffers in Minimizing Impacts of Clearcut Timber Harvest Operations on Shade-Producing Canopy Cover, Microclimate, and Water Temperature along a Headwater Stream in Northern California, UC Berkeley Dissertation, 2003.]

The statements about Dr. James’ dissertation work are not accurate. The results of Dr. James’ study are consistent with and support the concept of preserving shade to prevent water temperatures increases. Dr. James’ experiment measured temperature change associated with a small change in solar radiation reaching the water surface. In her experiment, vertical canopy coverage was reduced 7% on average (55-58% overhead canopy pre-harvest to 49-50% overhead canopy post-harvest). Angular canopy density (a measure of canopy between the path of the sun and observer) was reduced by 5% mid-stream to 85%. The difference in average daily water temperature between the most upstream and downstream sites increased up to 0.5 °C at the hottest time of year. Also, the difference in daily maximum water temperature between upstream and downstream sites indicate the possibility of as much as a 1.0 °C to 1.8 °C increase in temperature through the reach following the second phase of the study, in which the width of the riparian buffer was decreased from 175’ to 100’.

The results of Dr. James’ research support the concept of preserving shade to prevent water temperatures increases embraced in the proposed Policy. In the case of her study, a small increase in solar radiation resulted in a small increase in temperature.

Submitted Temperature Data:

Some comments referred to data collected before and after timber harvest as evidence the shade provisions of the proposed Policy are based on false premises. These data were also mentioned in rebuttal to the proposed Policy’s statement that timber harvest can increase temperatures. RWB staff agree that increased water temperature is not an inevitable outcome of timber harvest; however, it is also true that timber harvest *can* increase water temperature. The data showing no temperature increase following timber harvest are an indication of good management practices, but does not refute the importance of preserving shade to prevent water temperature increases.

General Issue 3: Proposed Policy is Broad and Flexible Enough to Accommodate Variety in the Region

Many commenters stated that a regionwide approach is not appropriate for a region so large and varied as the north coast region, citing the variety of geologies, vegetation types, air temperature conditions, and aquatic species present in waterbodies throughout the region.

Response

All of the streams in the region are subject to the laws of thermodynamics and respond to heat sources and sinks as those laws dictate. While some areas in the region have unique attributes that affect the temperature setting (e.g., large springs in the Cascades, snow melt hydrology in the Klamath Mountains, low flows and stratified pools in the Coast Ranges, etc.), water temperatures respond similarly to the drivers of stream temperature. For instance, water will become warmer with increasing sunlight in any part of the region. The various vegetation types have different inherent abilities to provide shade to a watercourse. However, in all cases shade provided by vegetation limits solar insolation, thereby limiting temperature increases.

Temperature source analyses have been completed for just less than half of the region, including areas both far from and near to the coast, and with a range of hydrologic and vegetation conditions. Those temperature TMDL analyses have consistently found the same factors to be responsible for elevated water temperatures: increased exposure to solar radiation due to loss of stream shade, physical stream channel alteration in response to elevated sediment loads, and in some cases agricultural tail water, impoundments, and water diversions.

The approach articulated in the proposed Policy will lead to compliance with the water quality objectives for temperature, regardless of what species are present. This is because the water quality objectives for temperature are stated in relation to unaltered temperatures, not a specific numeric temperature criterion. This aspect of the temperature objective establishes a temperature regime that is appropriate for a site, and is based on the site-specific conditions, not the temperature requirements of one species or another. The temperature requirements of species are only evaluated when actions resulting in altered temperatures are proposed.

General Issue 4: Proposed Policy is Broad and Flexible Enough to Accommodate Site-Specific Circumstances

Some commenters encouraged the RWB to take a case-by-case approach to addressing elevated water temperatures, or to defer action until a water temperature impairment has been identified and to rely solely on the TMDL process to address temperature issues.

Response

The RWB's experience gained from developing temperature TMDL source analyses for almost half of the region has made it clear that some situations require the more rigorous approach taken in the TMDL process, while other issues have a commonality throughout the north coast. This proposed Policy identifies those factors (i.e., shade, cold water flows, and channel structure) that need to be considered and addressed to prevent or ameliorate elevated water temperature in any situation. An approach that ignores widespread, widely understood factors until the completion of a TMDL is not cost effective, nor does it prevent elevated water temperatures in waterbodies that are currently meeting water quality objectives.

Many of the actions required to recover water temperature impaired waterbodies are the same actions required to prevent impairment of water temperatures (e.g., allow vegetation to shade waterbodies, maintain cold water sources, and prevent adverse changes in channel geometry). Therefore, it is appropriate to have a consistent approach to regulating water temperatures that addresses these factors. There may be other unique factors present in a waterbody that elevate the water temperature (e.g., irrigation tailwater). This proposed Policy instructs RWB staff to use existing authorities to address these factors.

General Issue 5: Identifying Factors Pre-Judges Decisions

Some commenters have stated that by identifying activities that can lead to elevated water temperatures, the proposed Policy is an indictment against those activities.

Response

The proposed Policy is not intended to be an indictment against certain land use activities. It simply identifies various activities that occur in the region that have a potential to elevate water temperatures, along with a corresponding regulatory mechanism to address compliance with the water quality objectives for temperature. For example, timber activities are identified as an activity that **can** lead to elevated water temperatures (note: the resolution does not say those activities **will always** result in elevated water temperatures), and the Non-Federal Timber Waiver, General Waste Discharge Requirements for Timber Activities, and the Waiver for Nonpoint Discharges on Federal lands are identified as the regulatory mechanisms for achieving compliance with the water quality objectives for temperature for those activities. Similarly, the alteration of stream beds and banks is identified as an activity that can lead to elevated water temperature, and the 401 certification process is identified as the appropriate mechanism to address temperature concerns.

General Issue 6: The Policy is Consistent with the Ongoing Review of the NTMP Provisions of Order No. R1-2009-0038 and Does Not Undermine that Effort.

Many commenters stated that the adoption of the proposed Policy will confuse and undermine the on-going effort to resolve petitions to Order No. R1-2009-0038, *Categorical Waiver of Waste Discharge Requirements for Discharges Related to Timber Harvest Activities on Non-Federal Lands in the North Coast Region*.

Response:

The *Policy for Implementation of the Water Quality Objective for Temperature in the North Coast Region* (Resolution No. R1-2011-0069) describes a regulatory framework to address exceedences of the water quality objective for temperature where they occur, and prevent exceedences where the objective is currently achieved, using existing authorities. The Policy does not provide the Regional Water Board with additional authorities, nor does it implement any new regulatory tools.

Order No. R1-2011-0038, the *Limited Term Amendment to NTMP Provisions of Order No. R1-2009-0038, Categorical Waiver of Waste Discharge Requirements for Discharges Related to Timber Harvest Activities on Non-Federal Lands in the North Coast Region* temporarily suspends, through January 2012, some of the temperature-

related conditions for non industrial timber management plans (NTMPs). The limited term amendment makes no changes with respect to timber harvest plans. During this period, the Regional Water Board staff, in collaboration with by the California Department of Forestry and Fire Protection (CAL FIRE), are evaluating the application of revised Forest Practice Rules to older NTMPs and the adequacy of the Forest Practice Rules to protect water quality. The Regional Water Board staff are conducting three investigations for this evaluation:

- A file review to evaluate how older NTMPs are updated in accordance with revised Forest Practice Rules.
- An analysis to identify any sections of the Forest Practice Rules that are inadequate to protect water quality standards.
- Field surveys to evaluate the effectiveness of NTMPs in preventing erosion from roads and to help determine if Erosion Control Plans or Road Plans are necessary for NTMPs to meet water quality standards.

The findings of these investigations are expected to be released in late 2011, and depending upon the results, stakeholder and Regional Water Board member input, staff may make recommendations for Board consideration to modify certain components of the Waiver pertaining to NTMPs. The proposed Policy directs staff to integrate shade controls into various enrollments and permits as appropriate, but is not specific regarding exactly how or to what extent. Shade is identified as a necessary component of future permits, but again, the Policy does not dictate or specify exact requirements. This broad-based approach is not expected to conflict with any findings that may result from the NTMP review.

The evaluation of temperature protection provided by the Forest Practice Rules is relative to the Basin Plan's intrastate water quality objective for temperature, which this proposed Policy implements. Thus, the proposed Policy and the investigations conducted following Order No. R1-2011-0038 are consistent with each other. Any potential modifications associated with temperature-related Waiver conditions for NTMPs must also be consistent with the Basin Plan's water quality objective for temperature, thus the current investigation underway is not in conflict with the intent and language of the proposed Policy.

RWB staff have modified the language discussing potential timber harvest impacts to water temperature to clarify that the ASP rule canopy protections are generally protective of shade and water temperatures in the areas where they apply (i.e. anadromous class I streams and class II-large streams within 1000 feet of anadromous class I streams).