Regional Water Quality Control Board
North Coast Region
Staff's Summary Report
April 4, 2024

ITEM: 6

SUBJECT: Update on Climate Change Adaptation and Resilience Initiatives of the North Coast Regional Water Board *(Matt St. John)*

BOARD ACTION: This is an informational item; no action will be taken by the Board.

BACKGROUND: Climate change is intensifying rainfall and floods, lengthening periods of drought, and shifting weather patterns across the globe, causing profound effects on terrestrial and aquatic ecosystems, water supplies and water quality. The North Coast of California is no exception, having experienced precipitation whiplash in recent years – dramatic swings from prolonged drought causing strained water supplies for humans and the environment and contributing to catastrophic wildfires, to atmospheric rivers and extensive flooding. Localized changes in climate in the North Coast Region include rising temperatures, shifts in precipitation patterns, including fog dynamics, and more extreme king tides and sea level rise.

Climate instability and extremes are causing an increasing frequency of water-related disasters around the world and in the North Coast. While these events are primarily related to water *quantity* – either too little (leading to diminished water supply for humans and wildlife) or too much (leading to flooding and sea level rise) – impacts related to water *quality* are increasing as well. Temperature increases, sea level rise, and changes in precipitation are causing degradation of water quality objectives and stressing beneficial use support. **Figure 1** is from the Fifth National Climate Assessment (https://nca2023.globalchange.gov/) and illustrates the linkages between climate change exposure pathways to climate hazards and impacts on water quality. Many of the beneficial uses of waters in the North Coast region are or can be strained by climate change, including Municipal and Domestic Supply; Agricultural Supply; Groundwater Recharge; Cold Freshwater Habitat; Estuarine Habitat; Rare, Threatened, or Endangered Species; Native American Culture; and Subsistence Fishing, to name a few.

The North Coast Region Report (https://www.energy.ca.gov/sites/default/files/2019-11/Reg_Report-SUM-CCCA4-2018-001_NorthCoast_ADA.pdf) of California's Fourth Climate Change Assessment (https://www.climateassessment.ca.gov/) includes the following predicted climate change effects in the North Coast region:

- Average annual maximum temperatures are likely to increase by 5-9 °F throughout the region through the end of the 21st century. Interior regions will experience the greatest degree of warming.
- Annual precipitation is not expected to change significantly but will likely be delivered in more intense storms and within a shorter wet season. As a result, the region is expected to experience prolonged dry seasons and reduced soil moisture conditions, even if annual precipitation stays the same or moderately increases. Less precipitation will fall as snow and total snowpack will be a small fraction of its historical average.
- There is a higher likelihood of extreme wet years and extreme dry years (drought). An “average” rainfall year will become less common.
- Rise in extreme precipitation events will increase the frequency and extent of flooding in low-lying areas, particularly along the coast where flood risk will be enhanced with rising sea levels.
- Streamflows in the dry season are expected to decline and peak flows in the winter are likely to increase.
- Sea-level rise projections differ along the coast but are greatest for the Humboldt Bay region and Eel River delta, threatening communities, prime agricultural land, critical infrastructure, and wildlife habitat.
- Wildfires will continue to be a major disturbance in the region. Future wildfire projections suggest a longer fire season, an increase in wildfire frequency, and an expansion of the area susceptible to fire.

In addition to terrestrial and aquatic ecosystems being impacted by the effects of climate change, social systems and the built environment are vulnerable to the impacts of climate-driven disruptions, including critical infrastructure such as water supplies, wastewater treatment facilities, as well as transportation, energy, and communication networks. Globally and in the North Coast Region the impacts from climate-driven disruptions are disproportionately experienced by vulnerable populations, including disadvantaged communities, Tribes, and people of color, as well as people with health issues. Therefore, there is an undeniable intersection between climate change impacts and environmental justice.

Since 2014 the North Coast Regional Board has included climate change as a priority issue in the Triennial Review. Though the Regional Water Board does not have a single comprehensive climate change adaptation and resilience strategy, we have made steady progress in incorporating considerations of climate change in many of our regulatory and non-regulatory programs. In January 2023 the Regional Water Board created a Climate Specialist position in order to advance our agency’s strategic initiatives addressing climate change.

DISCUSSION: The Regional Water Board's strategy for addressing climate change impacts on water resources is still evolving. This Staff Summary Report outlines the priority climate change adaptation and resilience strategic initiatives that staff of the North Coast Regional Water Board are currently working on or plan to work on. These initiatives reflect a combination of projects that utilize the Regional Water Board's existing regulatory authorities, projects that explore the development of new regulations or application of less common regulatory tools, as well as non-regulatory initiatives aimed at leveraging partnerships to achieve common climate resilience goals. These initiatives are informed by and aligned with various strategies and policies of the state of California.

Select Federal and State of California Climate Change Strategies and Policies

The California Climate Adaptation Strategy (https://climateresilience.ca.gov/) (2021) was mandated by AB 1482 and links together California's existing and planned adaptation efforts organized around six climate resilience outcome-based priorities. Several of the Regional Water Board staff's priority initiatives align with the following priorities, goals, and actions in California's Climate Adaptation Strategy:

- Priority - Accelerate Nature-Based Climate Solutions and Strengthen Climate Resilience of Natural Systems
  - Goal: Increase the pace and scale of nature-based climate solutions.
  - Actions: Protect, restore, and create coastal wetlands.
    Support planning and building capacity to implement climate smart agricultural practices.
  - Goal: Increase landscape connectivity and establish climate refugia.
  - Actions: Maintain and increase areas of high resilience to climate change.
    Reconnect aquatic and terrestrial habitats to help fish and wildlife endure drought and adapt to climate change.
    Restore and expand rivers to improve water quality and storage, enhance wildlife habitat and biodiversity, sequester carbon, and buffer floods.
- Priority - Strengthen Protections for Climate Vulnerable Communities
  - Goal: Engage with and build capacity for climate vulnerable communities.
  - Actions: Prioritize social equity, tribal nations, and disadvantaged communities in climate adaptation planning and strategies.
  - Goal: Build resilience in climate vulnerable communities through state programs.
  - Actions: Consider and integrate environmental justice principles in permit decisions and planning documents that drive on California's climate adaptation priorities.
    Prioritize climate resilience and health equity resources for people and places experiencing the most need and risks due to historical and continuing disinvestment and inequities.

In October of 2020 Governor Newsom issued Executive Order N-82-20 (https://www.gov.ca.gov/wp-content/uploads/2020/10/10.07.2020-EO-N-82-20-.pdf) which called for accelerated use of ***nature-based solutions*** that "deliver on our climate

change goals and other critical priorities, such as improving public health and safety, securing our food and water supplies, and increasing equity". Nature-based solutions are actions to protect, manage and restore natural or modified ecosystems, which effectively and adaptively address societal challenges, providing benefits to ecosystems and human well-being. Societal challenges include climate change and natural disasters, which impact ecosystems and human community vitality[1].

In 2022 the White House released Opportunities for Accelerating Nature-Based Solutions: A Roadmap for Climate Progress, Thriving Nature, Equity, and Prosperity (https://www.whitehouse.gov/wp-content/uploads/2022/11/Nature-Based-Solutions-Roadmap.pdf) which provides recommendations to unlock the potential of nature-based solutions to adapt to and mitigate the impacts of climate change. The White House identified nature-based solutions as a fundamental pillar of fighting climate change, along with reducing greenhouse gas emissions, deploying renewable energy, and increasing energy efficiency. Examples of nature-based solutions from the White House report include conserving or restoring coastal habitats, forests, wetlands, and grasslands; floodplain reconnection and restoration; protection and restoration of riparian buffers; groundwater recharge; bioswales; and living shorelines, to name a few. Though the recommendations included in the Roadmap apply to the federal government, they can inform actions in California. With this in mind, the following recommendations are salient: update policies and guidance to make it easier to consider and use nature-based solutions; integrate nature-based solutions into financial assistance and incentives programs; and prioritizing research and innovation to fill gaps in our understanding of nature-based solutions and when to use them.

In addition, Executive Order N-82-20 established a goal for the state of California to conserve 30% of California's lands and coastal waters by 2030. The ***30X30 goal*** is intended to help accelerate conservation of lands and coastal waters through voluntary, collaborative action with partners in order to conserve and restore biodiversity, expand access to nature, and mitigate and build resilience to climate change.

In 2021 the Newsom Administration released the Electricity System of the Future (https://www.gov.ca.gov/wp-content/uploads/2021/07/Electricity-System-of-the-Future-7.30.21.pdf), a roadmap to a future where clean electricity increasingly powers the daily lives of Californians, and the subsequent 2023 Building the Electricity Grid of The Future: California's Clean Energy Transition Plan (https://www.gov.ca.gov/wp-content/uploads/2023/05/CAEnergyTransitionPlan.pdf) which details how the state is implementing the transition to 100% clean energy including a goal of generating 25 gigawatts (GW) of offshore wind energy by 2045. This plan listed the expansion of offshore wind turbines as a key component of creating a firm, flexible energy resource. California's efforts are also a critical component of federal efforts, where the Biden Administration has recently set a goal of producing 30 GW of offshore wind energy by 2030 nationwide. One gigawatt of energy is estimated to provide sufficient energy to power between 200,000 to 500,000 homes.

[1] Definition adapted from World Conservation Congress Resolution 069.

In 2022, following several years of devastating drought in California, the Newsom Administration released California's Water Supply Strategy: Adapting to a Hotter, Drier Future (https://resources.ca.gov/-/media/CNRA-Website/Files/Initiatives/Water-Resilience/CA-Water-Supply-Strategy.pdf) which called for investing in new sources of water supply, accelerating projects and modernizing how the state manages water through new technology. This strategy outlines goals towards securing water supplies by:

1) Developing new water through recycling and desalination;
2) Capturing and saving more stormwater above and below ground;
3) Reducing use of water in cities and on farms; and
4) Improving all water management actions with better data, forecasting, conveyance, and administration of water rights.

In January 2024 the Newsom Administration released the California Salmon Strategy for a Hotter Drier Future: Restoring Aquatic Ecosystems in the Agee of Climate Change (https://www.gov.ca.gov/wp-content/uploads/2024/01/Salmon-Strategy-for-a-Hotter-Drier-Future.pdf) which outlines new actions and efforts already well underway that California is taking to help restore California's salmon populations. Many climate-related initiatives the North Coast Regional Water Board and the State Water Board are already engaged in align with the following priorities outlined in the Salmon Strategy:

- Remove Barriers and Modernize Infrastructure for Salmon Migration
- Restore and Expand Habitat for Salmon Spawning and Rearing
- Protect Water Flows and Water Quality in Key Rivers at the Right Times to Support Salmon
- Transform Technology and Management Systems for Climate Adaptability

Regional Water Board Climate Change Initiatives

Informed by these strategies - California's 2021 Climate Adaptation Strategy, Executive Order N-82-20, the White House Roadmap for Climate Progress, California's Salmon Strategy, California's Water Supply Strategy, and California's Clean Energy Transition Plan - North Coast Reigonal Water Board staff are working on the following priority climate change adaptation and resilience initiatives:

Shoreline Adaptation Atlas for Humboldt Bay

In collaboration with the Blue Lake Rancheria, the Regional Water Board has applied for grant funding to develop a Shoreline Adaptation Atlas for Humboldt Bay, traditionally known as Wigi by the Wiyot people. The Adaption Atlas would provide one of the most climate-vulnerable and underserved regions of California with tools to support the collaborative and equitable planning and implementation of nature-based solutions to rising sea levels and more extreme storms. The Humboldt Bay area is economically disadvantaged and is experiencing the fastest rate of relative sea level rise along the west coast of the United States. Sea level rise and more extreme storms threaten Humboldt Bay communities, ecosystems, cultural resources, and critical infrastructure. The Adaptation Atlas will provide an inclusive and collaborative science-based

framework for phased adaptation strategies that are appropriate for the diverse shorelines of Humboldt Bay and take advantage of natural processes to provide lasting resilience from the impacts of climate change. The Adaptation Atlas will utilize cutting-edge science and robust community engagement to help build enduring capacity to support the social, economic, and ecological resilience of the entire region. This vision is inspired by and modeled after the successful development and implementation of the San Francisco Bay Shoreline Adaptation Atlas (https://www.sfei.org/adaptationatlas), which is serving as a catalyst for inclusive, cross-jurisdictional, long-term strategies for nature-based solutions planning, permitting, and implementation in the San Francisco Bay region.

Designation of Outstanding National Resource Waters

Outstanding National Resource Water (ONRW) is a designation defined under the Clean Water Act, which restricts the degradation of high quality waters or waters of exceptional recreational or ecological value. The two ONRWs currently in California include Mono Lake and Lake Tahoe, both in the Lahontan Region. Regional Water Board staff believe that ONRW designation could be a valuable tool to provide heightened protection from degradation for waterbodies that provide resilience to climate change, such as waterbodies that have relatively high summertime baseflows of cold water. In response to requests from several non-governmental fisheries organizations as part of the 2023 Triennial Review, in June of 2024 Regional Water Board staff will recommend to the Board to initiate a project to evaluate designation of two North Coast waterbodies as ONRW, Cedar Creek and Elder Creek, tributaries to the South Fork Eel River. Designation of an ONRW would require amendment to the Water Quality Control Plan of the North Coast Region (Basin Plan) and would include a program of implementation. This process would be subject to peer review, as well as a robust public review process.

Removal of Klamath Dams and Upper Basin Water Quality Improvement Projects

The removal of the hydroelectric dams on the Klamath River is underway. Regional Water Board staff are supporting the State Water Board as they administer the 401 Water Quality Certification associated with this historic dam removal and restoration project. Related to dam removal and a component of the Klamath Hydroelectric Settlement Agreement's Interim Measure 11, PacifiCorp has provided $6.8 M for implementation of water quality improvement projects above Upper Klamath Lake in Oregon where nutrient inputs are most impactful to the Klamath River system's water quality. The Regional Water Board's Climate Specialist is serving on a Steering Committee which will review and select nutrient reduction projects for funding. These water quality improvement projects will be important to supporting water quality standards in California, and in combination with removal of the Klamath River dams, this work will contribute to establishing vital resiliency for the Klamath River Basin.

Potter Valley Hydroelectric Project

In November 2023 Pacific Gas and Electric Company (PG&E) released for public review an Initial Draft Surrender Application and Conceptual Decommissioning Plan for the Potter Valley Hydroelectric Project, initiating a process of decommissioning and removal of Scott Dam and Cape Horn Dam on the Eel River followed by restoration of Lake Pillsbury and Van Arsdale Reservoir to run-of-river conditions. At this stage of the project the Regional Water Board's Climate Specialist, Flow and Riparian Specialist, and 401 Program staff are providing support to the State Water Board who will be developing the 401 Water Quality Certification and associated CEQA review for this multi-year project. Cape Horn and Scott Dams currently block access to 288 miles of pristine upper watershed habitat in the Eel River, and their removal would make the Eel the longest free-flowing rivers in California, greatly contributing to climate change resilience for this watershed.

Flow Related Projects

The Regional Water Board's Flow and Riparian Specialist and the Scott and Shasta Steward provide technical support to the State Water Board's Division of Water Rights on a handful of projects aimed at establishing minimum instream flow requirements. Projects include efforts led by the California Department of Fish and Wildlife in the South Fork Eel River, Mark West Creek, Mattole River, and North Fork Navarro River, streams identified for instream flow analysis in the 2014 California Water Action Plan, as well as the Division of Water Right's work in the Scott and Shasta Rivers pursuant to emergency declarations. Also, recognizing that water quantity can have direct influences on various physical, biological, and chemical parameters of water quality, the Flow and Riparian Specialist is drafting a narrative flow objective to augment the constituent-based water quality objectives contained in the Basin Plan with a clearly articulated characterization of the hydrologic conditions necessary to support beneficial uses. Given the observed and expected decline in dry season streamflows and increases in winter season peak flows due to climate disruption, development of a narrative flow objective is a potentially effective new tool and therefore the Climate Specialist is providing targeted support, where needed.

Agricultural Lands Discharge Permits

In 2023 the Regional Water Board consolidated the development and implementation of its agricultural lands discharge program into a new Agriculture Unit within the Agriculture and Enforcement Division. Staff in this division are currently developing new permits for vineyard operations and lily bulb production, as well as revising the existing permits for ranching operations in the Scott and Shasta River watersheds. The Climate Specialist is providing targeted support for these permit development efforts given the opportunity for carbon sequestration from agricultural working lands. For the Scott and Shasta River permits, in particular, the Climate Specialist is coordinating with the Scott and Shasta Steward to incorporate in the revised permit opportunities for irrigation efficiency and water conservation where there is a nexus with waste discharge control.

Humboldt Bay Offshore Wind Heavy Lift Marine Terminal Project

The Humboldt Bay Harbor District has initiated engagement with the Regional Water Board, among other state, federal, and local agencies, on the proposed Humboldt Bay Offshore Wind Heavy Lift Marine Terminal Project (https://humboldtbay.org/humboldt-bay-offshore-wind-heavy-lift-marine-terminal-project-3) (Wind Port), which will support future installation and operation of a wind farm offshore of Humboldt Bay in the Humboldt Bay Wind Energy Area (https://www.boem.gov/renewable-energy/state-activities/humboldt-wind-energy-area). The Wind Port is proposed to cover approximately 180 acres (plus floating storage) on the Samoa Peninsula in Humboldt Bay and provide the manufacturing, installation, operation, maintenance, and construction of 900' tall wind turbines and floating platforms. Implementation of this project will require 401 Water Quality Certification for site development and for dredging, as well as other potential permits (e.g., Construction and Industrial Stormwater). The project is anticipated to include a substantial quantity of dredging with millions of cubic yards of sand and silt/clay which could be available for beneficial reuse over the course of multiple years, including for climate change adaptation and resilience projects in and near Humboldt Bay, such as augmenting salt marshes to keep pace with sea level rise; creating living shoreline to attenuate wave-generated erosion; or raising specific sites in preparation for sea level rise. Given the potential for the proposed project to advance California's Clean Energy Transition Plan, as well as the important opportunity to beneficially reuse dredge materials for climate change adaptation and resilience projects, the Climate Specialist will be supporting 401 Program staff and coordination with other agencies, particularly with respect to mitigation associated with project impacts and the beneficial reuse of dredge materials.

Racial Equity Action Plan

In February 2023 the Regional Water Board adopted a Racial Equity Resolution (https://waterboards.ca.gov/northcoast/board_info/board_meetings/02_2023/pdf/6/2301_racialequity.pdf) which directs Regional Water Board staff to develop a Racial Equity Action Plan that articulates a vision for racial equity and outlines specific actions to address Regional Water Board systems that perpetuate racial inequities while establishing new equitable and resilient systems. As stated above, there is an undeniable intersection between climate change impacts and environmental justice; therefore, the Climate Specialist will help guide the development of the Racial Equity Action Plan to ensure it includes actions that address environmental justice and inequities.

Other Planned Initiatives

In addition to the initiatives summarized above that the Climate Specialist and other staff are actively working on, the Climate Specialist intends to advance the following additional North Coast initiatives over the coming years:

- Working with Regional Water Board colleagues in various programs to develop a strategy to promote the identification, funding, planning, permitting, and implementation of various types of projects that incorporate principles of nature-based solutions and enhance landscape resilience to climate change.

- Coordinate with state and local partners and landowners to promote voluntary conservation of land where such conservation enhances resiliency.

- Coordinate with the Regional Water Board's wastewater permitting program to promote water recycling in the region and to optimize local use of recycled water.

- Coordinate with the Regional Water Board's stormwater program and Groundwater Specialist to advance opportunities for stormwater capture and groundwater recharge projects.

- Coordinate with the Regional Water Board's Forest Activities Program to promote opportunities to enhance carbon sequestration within forestlands and optimize fuels management projects to reduce the risks of catastrophic wildfires.

- Coordinate with the Regional Water Board's Groundwater Permitting Unit to promote development of a new composting facility in Sonoma County and to promote on-farm composting regionally.

- Coordinate with various Regional Water Board programs to promote regional monitoring and assessment that provides data and information to inform climate change adaptation and resilience actions.

RECOMMENDATION: N/A

SUPPORTING DOCUMENTS: See documents linked within this summary report.

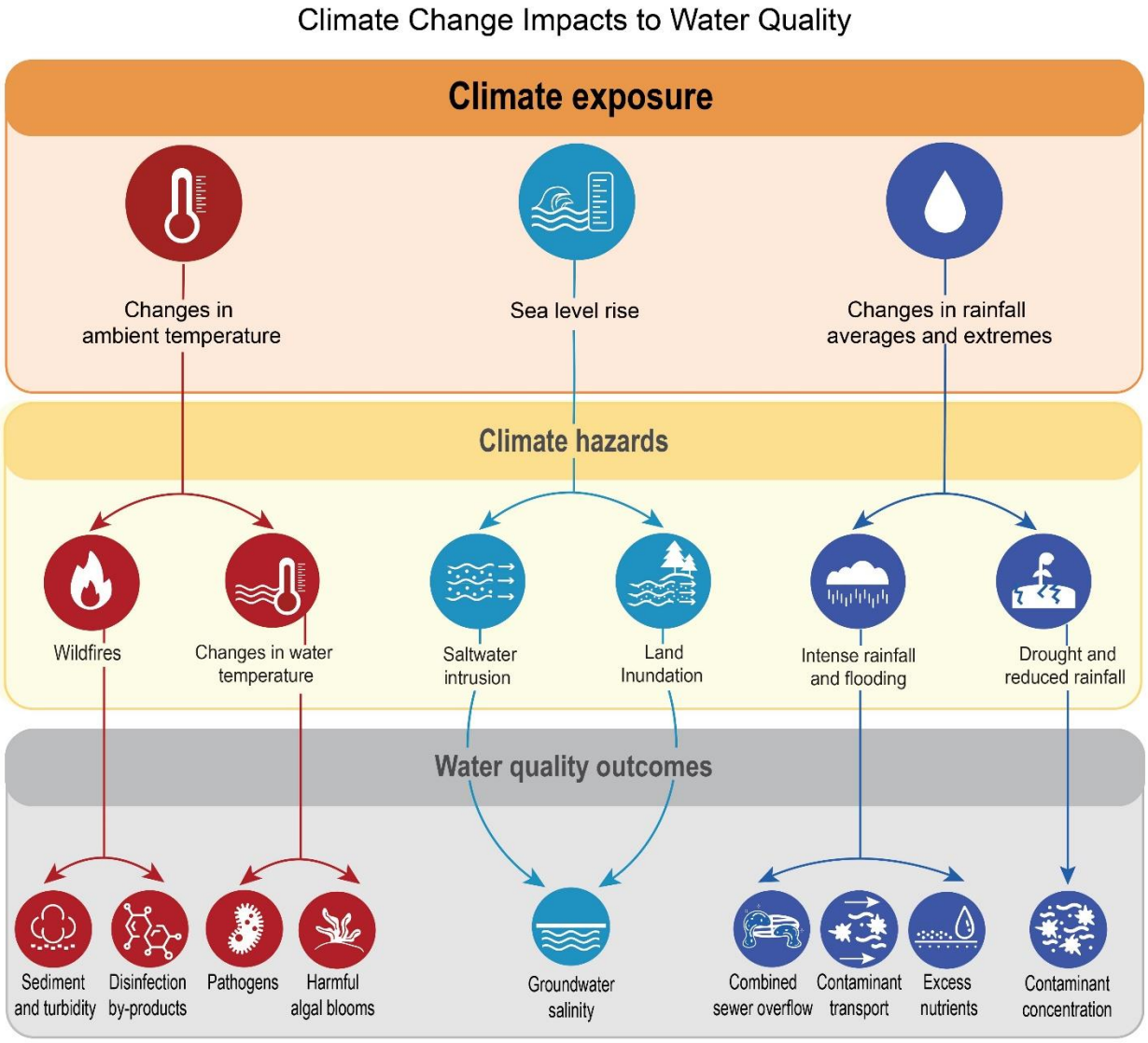

Figure 1: Climate Change Impacts to Water Quality. (globalchange.gov)