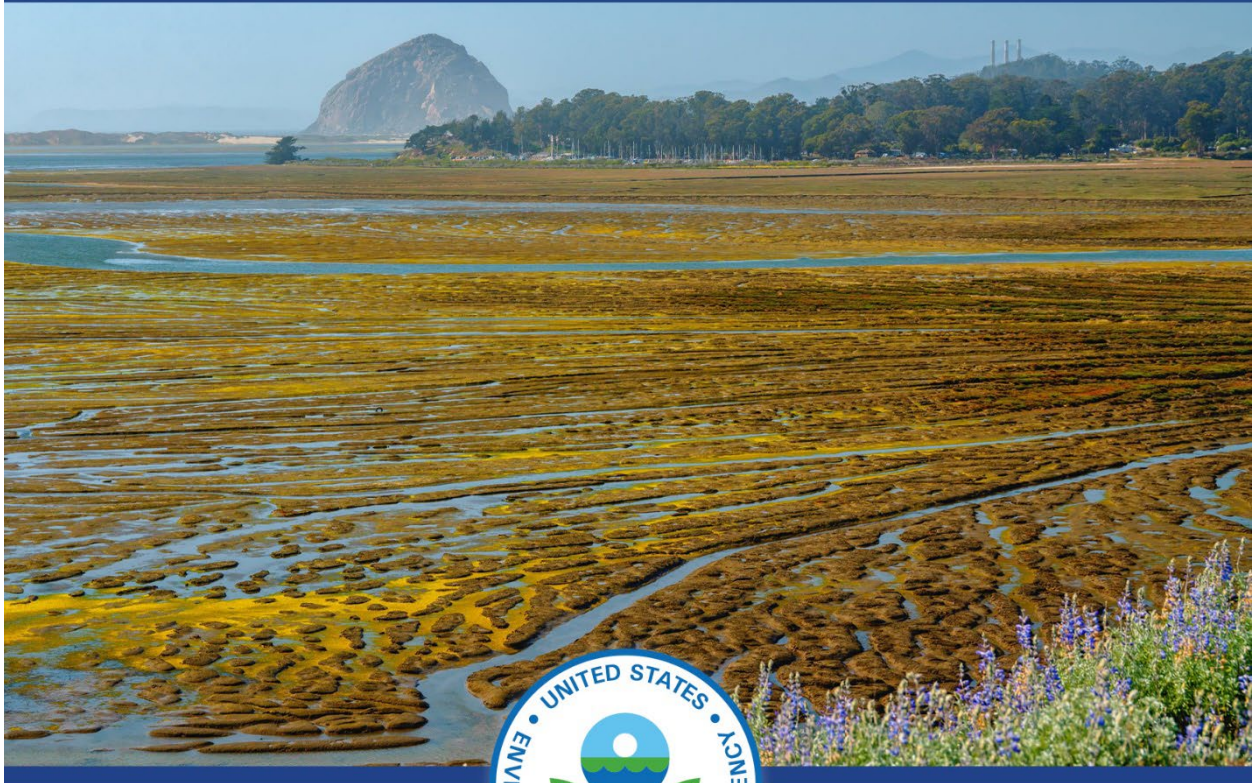


U.S. ENVIRONMENTAL PROTECTION AGENCY



REGION 9

Climate Change Adaptation Implementation Plan

OCTOBER 2022

Image Source: Nature, food, landscape, travel by Getty Images

Disclaimer

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 12 2022



DEPUTY ADMINISTRATOR

Preface

Climate change is threatening communities across the nation. Millions of Americans feel the destructive effects of climate change each year when the power goes down, rivers and lakes go dry, homes are destroyed by wildfires and communities are flooded by hurricanes. Underserved communities are especially vulnerable to the climate crisis and are more likely to experience the negative health and environmental effects of extreme weather events.

The Biden-Harris Administration is actively confronting the climate crisis while also advancing environmental justice. As part of a whole-of-government approach, the U.S. Environmental Protection Agency is strongly committed to taking the actions necessary to protect human health and the environment and to increase the resilience of the entire nation, even as the climate changes.

The EPA's commitment to action is reflected in its FY 2022-2024 Strategic Plan and in the 2021 Climate Adaptation Action Plan. Both documents present priority actions the agency will take to ensure that its programs, policies and operations remain effective under future climate conditions while we work to support states, territories, tribes and communities in increasing their own adaptive capacity and resilience to climate change impacts.

From flooding at Superfund sites, to wildfires causing air pollution, to sea-level rise affecting water quality and infrastructure, the EPA will boldly address climate impacts in both its programs and the communities it serves. We recognize the importance of tribal, state and local government partnerships in efficient, effective and equitable implementation of climate change adaptation strategies. Our plans were informed and improved by input we received in listening sessions we held to engage these and other partners as we developed these plans.

To ensure we are addressing the climate crisis in a comprehensive way, each of our national program and regional offices has developed individual Climate Adaptation Implementation Plans that outline how the EPA will attain the agencywide goals described in the broader Climate Adaptation Action Plan. These plans describe how programs and regions will integrate climate adaptation into their programs, partnerships and operations. They also describe how they will help partners build their resilience and capacity to adapt, while delivering co-benefits, including curbing greenhouse-gas emissions and other pollution, and

promoting public health, economic growth and climate justice. Of course, the EPA has a major role to play on emissions reductions as well, though that is not the focus of these plans. Indeed, we must focus on both climate adaptation and mitigation to ensure our nation and communities thrive in an era of climate change.

As part of this effort, we will empower our staff and partners by increasing awareness of how climate change may affect our collective ability to implement effective and resilient programs. We will also provide them with the necessary training, tools, data, information and technical support to make informed decisions and integrate climate adaptation into our work.

The EPA will work to modernize its financial assistance programs to encourage climate-resilient investments across the nation. We will also focus on ensuring that investments funded by the Bipartisan Infrastructure Law, the Inflation Reduction Act and other government programs are resilient to the impacts of climate change. Finally, as our knowledge advances and as impacts continue to develop, our response will likewise evolve. We will work to share these developments to enhance the collective resilience of our nation.

The actions outlined in these implementation plans reflect the EPA's commitment to build every community's capacity to anticipate, prepare for, adapt to and recover from the increasingly destructive impacts of climate change. Together with our partners, we will work to create a healthy and prosperous nation that is resilient to the ever-increasing impacts of climate change — which is vital to the EPA's goal of protecting human health and the environment and to ensuring the long-term success of our nation.



Janet G. McCabe

Acknowledgement

The development of this EPA Region 9 Climate Adaptation Implementation Plan could not have been possible without the collaboration and hard work of the Region 9 representatives on the Cross-EPA Workgroup on Climate Adaptation, the EPA Region 9 Climate Adaptation Group, and EPA Region 9 colleagues across all Divisions who provided content and edits. Thanks to the R9 managers whose support of our time and effort on this work was essential. Thanks also to the members of the Cross-EPA Workgroup in moving EPA forward in building resilience to climate impacts. Our actions now make it more possible to meet our mission to protect human health and the environment, today and in the future.

EPA Region 9 Representatives on the Cross-EPA Workgroup on Climate Adaptation

- Suzanne Marr (Water Division)
- Ray Saracino (Air and Radiation Division)
- Dana Mayfield (Air and Radiation Division)
- Nicole Moutoux (Land, Chemicals and Redevelopment Division)

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1. INTRODUCTION

Our climate is changing. According to the [US Global Change Research Program](#), Earth's climate is warming faster than at any point in modern history, primarily because of emissions of heat-trapping greenhouse gases from fossil fuel combustion, deforestation, and land-use change. We can already see impacts on lands and in waters across Region 9, which covers:

- Arizona, Nevada, California, and Hawai'i;
- Indian Country; and
- the Pacific Island Territories of American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands.

As droughts intensify and become more frequent as temperatures warm, wildfires are becoming more common and powerful. As tropical typhoons, cyclones, and hurricanes intensify, their impact is exacerbated by persistently rising sea levels. Air and water temperatures are reaching extreme and sustained highs. These impacts harm human health and the environment. They impact communities, their resources, and infrastructure, and they threaten our way of life.

In order to protect human health and the environment, even as the climate changes, and in order to assist EPA Region 9 states, tribes, territories, and their communities to build resilience to climate impacts, EPA Region 9 identified 39 climate adaptation actions described in this document, the EPA Region 9 Climate Adaptation Implementation Plan (CAIP). This plan is also a response to [Executive Order 14008, "Tackling the Climate Crisis at Home and Abroad,"](#) and the nationwide [2021 EPA Climate Adaptation Action Plan](#). Collaboration with our federal partners is important if we are to meet the challenge of the climate crisis.

The EPA works on both climate mitigation (controlling causes of climate change) and climate adaptation (building resilience to impacts resulting from climate change). Although both topics are important to address, this CAIP focuses on climate adaptation. EPA's work on climate adaptation and climate mitigation provides a combined approach to fight climate change and its impacts on communities and resources. As EPA and our partners work to mitigate climate change, the hope is that climate adaptation action will help us protect human health and the environment until we reach a more stable future.

Environmental justice is also a priority at EPA. [Executive Order 14008, "Tackling the Climate Crisis at Home and Abroad,"](#) established the White House Environmental Justice Advisory Council and the White House Environmental Justice Interagency Council. As we identify how to build consideration of climate impacts into EPA programs, and assist our partners in building resilience, we keep in mind the need to work with communities. This is critical in our partnerships with communities most at risk from climate impacts. We understand that climate change impacts can compound long-standing environmental and funding challenges for traditionally under-served communities, as seen in the EPA report [Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts](#).

The EPA, through the Office of Policy (OP), has requested that each EPA Regional Office and National Program Office develop a Climate Adaptation Implementation Plan (CAIP) that includes the following:

1. Designation of a Senior Career Leader responsible for overseeing climate adaptation activities in the office.
2. A Climate Vulnerability Assessment for the Program/Regional Office.
3. Five Priority actions per year that will be taken to address the agency-wide priorities identified in the draft 2021 Plan.
4. A training plan for enhancing staff knowledge about climate adaptation.
5. Identification of science needs.

EPA Region 9 has provided the items requested by EPA OP in this CAIP. The sections of this CAIP include:

- Section 2. Climate Adaptation Senior Leadership and Staffing
- Section 3. Climate Vulnerability Assessment
- Section 4. Climate Adaptation Actions
- Section 5. Climate Adaptation Training Plan and Needs
- Section 6. Climate Adaptation Science Needs
- Section 7. Conclusion

TRIBAL TREATY RIGHTS AND EPA REGION 9'S CLIMATE ADAPTATION PLAN

US EPA Region 9 takes Tribal Treaty Rights seriously, including in the development and implementation of this Region 9 Climate Adaptation Implementation Plan.

Under the Constitution, treaties with tribal nations are part of the supreme law of the land, establishing unique sets of rights, benefits and conditions for the treaty-making tribes who were forced to cede millions of acres of their homelands to the United States, in return for recognition of property rights in land and resources as well as federal protections. Tribal treaty rights have the same legal force and effect as federal statutes and they should be integrated into and given the fullest consideration throughout EPA's collective work. Reserved rights are the rights tribes retain that were not expressly granted to the United States by tribes in treaties. Treaty and reserved rights, including but not limited to the rights to hunt, fish and gather, may be found both on and off reservation lands. Agencies should consider treaty and reserved rights in developing and implementing climate adaptation plans in order to protect these rights and ensure the Agencies meet their legal and statutory obligations and other mission priorities as we work to combat the climate crisis.

In September 2021, EPA joined 16 other federal agencies in signing a [Memorandum of Understanding \(MOU\)](#) that committed those parties to identifying and protecting tribal treaty rights early in the decision-making and regulatory processes. Accordingly, EPA will consider and protect treaty and reserved rights in developing and implementing climate adaptation plans through strengthened consultation, additional staff training and annual reporting requirements.

As a group, EPA and its partners can combine forces to take effective climate adaptation action, especially when funding is available. The [Bipartisan Infrastructure Law \(BIL\)](#), also known as the Infrastructure Investment and Jobs Act, is providing funds that can support actions to build resilience to climate impacts. For example, funds are being made available in states, territories and Indian Country, as seen in the [Building a Better America Guidebook](#) (January 2022) and the associated website, [Build.gov](#).

This CAIP is a living document that will be updated periodically as EPA Region 9, and its partners in states, tribes, territories, and communities identify additional priority needs and actions to build climate resilience. EPA Region 9 welcomes comments and suggestions on this CAIP and on our work to build resilience to climate change impacts in collaboration with our partners, as we all work to better protect human health and the environment.

2. CLIMATE ADAPTATION SENIOR LEADERSHIP AND STAFFING

Deborah Jordan, the EPA Region 9 Deputy Regional Administrator, is the Senior Career Lead for climate adaptation at EPA Region 9. Suzanne Marr is the lead staff contact for climate adaptation. Ray Saracino, Dana Mayfield and Nicole Moutoux, along with Suzanne, represent EPA Region 9 on the Cross-EPA Climate Adaptation Workgroup. EPA Region 9 has a Climate Adaptation Group composed of representatives from each Division, with additional participation from other EPA Region 9 staff working on climate adaptation related efforts. The EPA Region 9 Climate Adaptation Group, and associated EPA Region 9 staff, were instrumental in developing this Climate Adaptation Implementation Plan and will be instrumental in implementing this CAIP and keeping it up to date.

3. CLIMATE VULNERABILITY ASSESSMENT

This Section is an assessment of climate vulnerabilities across Region 9. It has been updated from the assessment developed for the 2014 EPA Region 9 Climate Change Adaptation Implementation Plan. Each of the EPA Regions' Climate Adaptation Plans from 2014 can be found in this document: [Publication Number EPA-100-K-14-001P, May 2014](#).

This Section begins with an overview of impacts to each of the four EPA Region 9 States, then moves on to climate vulnerabilities for the Southwest Region (including Arizona, Nevada, and California), Indian Country, and the Pacific Islands [including Hawai'i, American Samoa, Guam and the Commonwealth of the Northern Mariana Islands, and the U.S. Freely Associated States of Micronesia (Republic of Marshall Islands, Republic of Palau, Federated States of Micronesia)]. The Section is divided into the following segments to bring focus to the vulnerabilities particular to specific regions and populations. The Section closes with a look at how the effectiveness of EPA programs is vulnerable to climate impacts.

- 3.1. Region 9 Overview
- 3.2. Vulnerabilities in the Southwest
- 3.3. Vulnerabilities of Tribes
- 3.4. Vulnerabilities in the Pacific Islands
- 3.5. Vulnerabilities of Communities and Individuals
- 3.6. Vulnerability of the Effectiveness of EPA Programs

3.1. Region 9 Overview

To understand our climate vulnerabilities, it is important to first understand climate impacts across the Region. EPA Region 9 encompasses Arizona, Nevada, California, and Hawaii, as well as the territories of American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands. Given the diversity in geography, climate change impacts vary greatly from one geographic area to another within Region 9, as exhibited by intensity of rainfall, drought, wildfire, typhoons/cyclones, daily and annual temperature ranges and extremes, and exposure to sea-level rise.

Information on climate impacts in Region 9 can be drawn from excellent sources. One valued source is the recently updated interactive NOAA website: [The State Climate Summaries](#). NOAA says that its summaries, "spell out recent local conditions for each state and ... show past observations and plausible future projections."¹



Figure 1. Map of EPA Region 9 States



Figure 2. Map of EPA Region 9 U.S. Pacific Island Territories and States

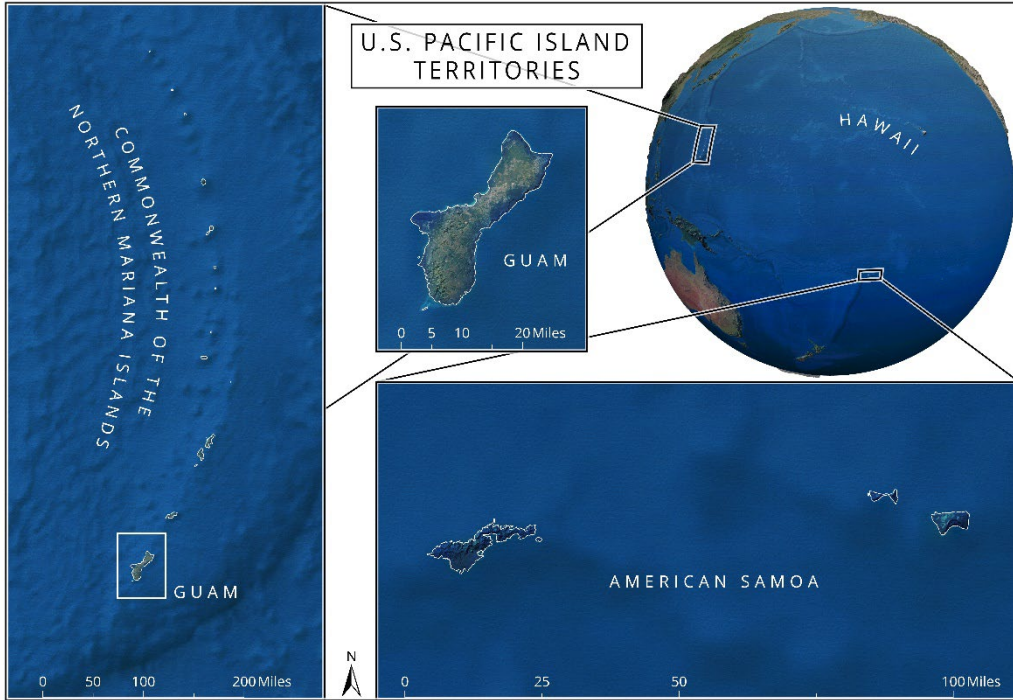


Figure 3. Map of U.S. Pacific Island Territories

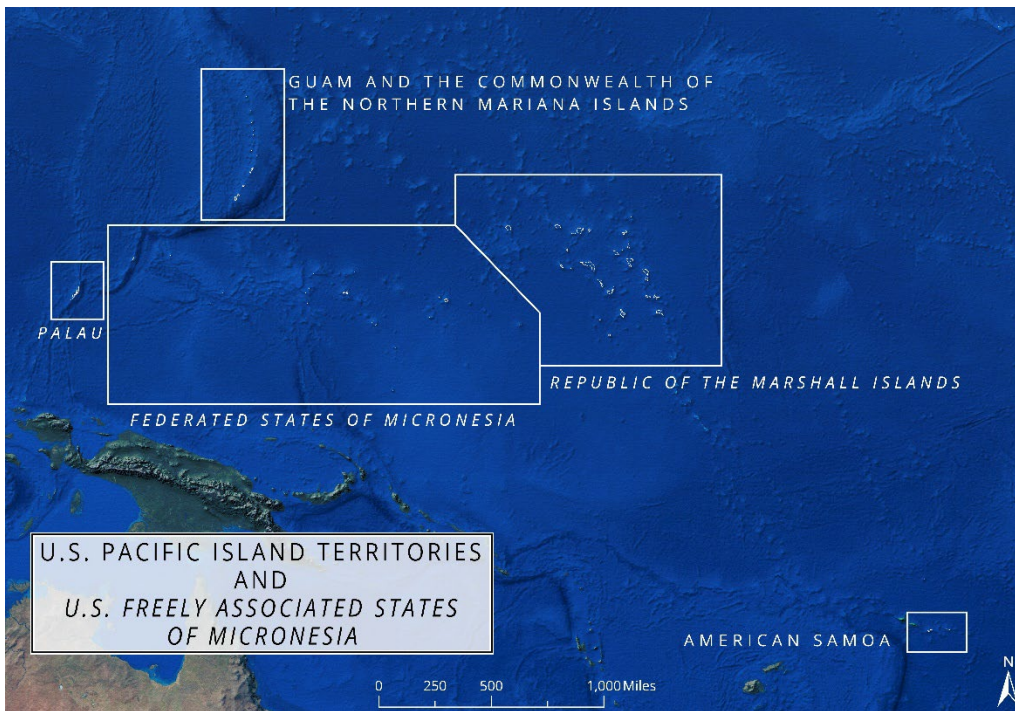


Figure 4. Map of U.S. Pacific Islands Territories and U.S. Freely Associated States of Micronesia

The following key messages from the NOAA summaries for each state are an excellent first step in reviewing climate impacts and assessing vulnerabilities. The state names listed here provide links to the State Climate Summaries web site.

[Arizona](#)

- **“Temperatures in Arizona have risen about 2.5 °F since the beginning of the 20th century.** Recent upward trends in average temperatures and extreme heat are projected to continue. Under a higher emissions pathway, historically unprecedented increases in annual average temperature are projected during this century.
- **Droughts are a serious threat in this water-scarce State.** The potential for more extended droughts in the future will pose a major challenge to Arizona’s environmental, agricultural, and human systems. The risk of very large wildfires is projected to increase.
- The summer monsoon rainfall, which provides much-needed water for grazing lands and their ecosystems, varies greatly from year to year. **Future trends in average monsoon rainfall are highly uncertain**, while high variability is expected to continue. Warmer temperatures may lead to reductions in late-season snowpack accumulation and negative impacts on valley communities that rely on the melting snowpack for summer water supplies.”²

[Nevada](#)

- **“Temperatures in Nevada have risen almost 2.4 °F since the beginning of the 20th century.** Under a higher emissions pathway, historically unprecedented warming is projected to continue through this century, with associated increases in heat wave intensity and decreases in cold wave intensity.
- **Nevada is the driest State in the United States, and future projections of annual precipitation are uncertain.** Increases in temperature are projected to lead to reductions in late winter and spring snowpack, with potential negative impacts to water supplies.
- Drought has been common since the beginning of this century. **Higher temperatures will increase the rate of soil moisture loss during dry spells, increasing the intensity of future naturally occurring droughts.** The frequency and severity of wildfires are projected to increase in Nevada and surrounding States.”³

[California](#)

- **“Temperatures in California have risen almost 3 °F since the beginning of the 20th century.** The six warmest years on record have all occurred since 2014. Under a higher emissions pathway, historically unprecedented warming is projected during this century.
- California snowpack plays a critical role in water supply and flood risk. **Projected earlier melting of the snowpack due to rising temperatures could have substantial negative impacts on water-dependent sectors and ecosystems.**
- **Global sea level is projected to rise, with a likely range of 1–4 feet by 2100.** This will increase coastal flooding and impact management of water supplies and transportation.”⁴

[Hawai’i](#)

- **“Temperatures in Hawai’i have risen by about 2 °F since 1950, with a sharp increase in warming over the last decade.** Under a higher emissions pathway, historically unprecedented warming is projected during this century.
- **Annual rainfall has decreased throughout Hawai’i since the early 1980s, with uncertain projections for the future.** The frequency and magnitude of extreme precipitation events have changed in recent years, but these changes are not uniform across the island chain. Extreme precipitation events have become less frequent for Kaua’i and O’ahu but more frequent for the Island of Hawai’i.

- **Sea-level rise will continue to be a major threat to the State’s coastline through inundation and erosion.”⁵**

In addition to NOAA’s information on individual states, the US Global Climate Research Program’s 2018 report, [“Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment Volume II” \(NCA4\)](#)⁶, provides much information on climate impacts and vulnerabilities. The summary of vulnerabilities listed below primarily draws on the NCA4 document. Please follow the links, provided here, to specific NCA4 chapters for more details and references. [Chapter 15: Tribes and Indigenous Peoples](#)⁷ focuses on the many climate impacts in Indian Country. Other Chapters focus on geographic regions including the [Southwest](#)⁸ and [Hawai’i and US-Affiliated Pacific Islands](#)⁹. The NCA4 also includes chapters describing climate impacts to resource types and sectors of use such as [Water](#)¹⁰, [Forests](#)¹¹, [Oceans and Marine Resources](#)¹², [Air Quality](#)¹³, [Human Health](#)¹⁴, [Transportation](#)¹⁵, and [Agriculture](#)¹⁶. We encourage you to explore these chapters and the others not listed here to gain a deeper understanding of climate impacts, risks, and adaptation.

The vulnerability assessment provided here is broad and brief. Many states, tribes, territories, local governments, regional organizations, and communities, as well as land-holding federal agencies, have completed their own climate vulnerability assessments. These geographically focused assessments provide an important perspective. Vulnerability assessments are often incorporated into Climate Adaptation Plans. Assessments and plans can be found at websites hosted by an assessment’s organization, or at websites that compile links to many assessments and plans, including:

- [Institute of Tribal Environmental Professionals. Tribal Climate Change Adaptation Planning Toolkit](#)
- [University of Oregon. Tribal Climate Change Guide. Adaptation Plans.](#)
- [Georgetown Climate Center. State Adaptation Progress Tracker.](#)

To see an example of a local organization’s vulnerability analysis, please see the climate vulnerability assessment posted by the California Tahoe Conservancy on its [website](#).

3.2. Vulnerabilities in the Southwest

The Southwest region, as described in the NCA4, covers Arizona, Nevada, and California, including the California coast. Much of the Southwest is arid with relatively high air temperatures. Several mountain ranges and the Pacific Ocean influence climate and water resources in certain parts of the Region. Water has typically been stored as snowpack during the winter and released to streams in the spring and early summer, helping to meet increasing water demands. Major river systems (e.g., the Sacramento-San Joaquin, and the Colorado) contribute to massive water storage and conveyance projects, where water is diverted from rivers for more widespread use by agriculture and growing cities. These rivers also contribute to essential hydropower supplies. The prospect of more extreme droughts is a significant concern, especially as the Southwest continues to lead the nation in population growth. Some climate impacts in the Southwest include:

- Warmer temperatures have reduced mountain snowpacks, and peak spring runoff from snow melt has shifted to earlier in the season, reducing fresh water supplies during the summer. A longer and hotter warm season will likely result in longer periods of extremely low flow and lower minimum flows in late summer. Water supply systems that have no storage or limited storage (e.g., small municipal reservoirs) may suffer seasonal shortages in summer.
- Extreme heat events pose significant stresses to health, energy, and water supply in a region that already experiences very high summer temperatures. This is particularly true when combined with urban heat island effects for major cities such as Phoenix, Tucson, Las Vegas, and many California cities. An increase in extreme heat events may also hit coastal communities hard, where individuals are not acclimated to persistent high

temperatures, nor is the infrastructure (e.g., less air conditioning, insulation). According to [OSHA](#), outdoor workers (e.g., farmworkers, construction workers) in arid climates may be exposed to extreme heat which can impact their physical and mental health and can be fatal.

- Groundwater supplies have been reduced as needs increase and basins are not recharged with sufficient precipitation. This pressure on groundwater increases when river system flows decline.
- Warmer ocean temperatures may decrease productivity by stopping the entrainment of deep supplies of nutrients. The resulting reductions in commercial species will need to be addressed to support continued production of fisheries and aquatic life.
- Sea-level rise is contributing to the loss of wetlands, buildings, and infrastructure along coastal corridors and on islands.
- The magnitude and frequency of wildfires have increased, which severely impacts water quality in streams, creeks, rivers, lakes, and estuaries. This also affects air quality, sometimes over a vast area. Post-fire debris flows can occur when high-intensity precipitation events hit vulnerable recently burned watersheds.
- According to the Good Neighbor Environmental Board's December 2016 report, "[Climate Change and Resilient Communities Along the US-Mexico Border: The Role of the Federal Agencies](#)"¹⁷, the US-Mexico border is one of the hottest, driest, and poorest regions in the US, but also one of the most rapidly growing areas and is vital to the prosperity of the region, as well as that of both countries. To address climate issues in this region requires binational solutions and international cooperation. Issues range from extreme heat, sea-level rise on the coasts, flooding, among others.

3.3. Vulnerabilities of Tribes in Indian Country

Tribes in Region 9 are impacted by the climate impacts listed above in the section on "Vulnerabilities in the Southwest." There are additional vulnerabilities for some tribes in Indian Country, and each tribe experiences its particular climate impacts. Drinking water supplies are at risk for tribes experiencing drought. Wildfires and their related debris flows can threaten tribes' communities, infrastructure, and resources. Increased temperatures and drought can contribute to harmful algal blooms that threaten people, livestock, fish, and traditional vegetation resources (e.g., plants used for making baskets).

Some tribes are in remote locations far from healthcare facilities or community clean air shelters. This can become a problem when wildfire smoke drastically reduces air quality and individuals with chronic conditions suffer. When wildfire threatens powerlines, Public Safety Power Shutoffs (PSPSs) can affect a Tribe's ability to provide safe and clean drinking water and other public services. Sea-level rise and the associated loss of habitable tribal lands is beginning to impact some California tribes faced with limited opportunities to move inland.

Drought is perhaps the most pervasive climate-induced impact on tribes. Water is at the heart of many tribal cultures and the foundation of livelihoods, economies, subsistence, and treaty rights. Water is essential to the sustainability of the fish, wildlife, and plants on which tribes rely. More severe and frequent droughts threaten the underpinnings of tribal communities.

3.4. Vulnerabilities in the Pacific Islands

The Pacific Islands in Region 9 encompass the State of Hawai'i and the United States affiliated Pacific Islands (USAPI), including three territories (American Samoa, Commonwealth of the Northern Mariana Islands (CNMI), and Guam) and the U.S.-Affiliated Pacific Islands of Micronesia (Republic of the Marshall Islands, Republic of Palau, Federated States of Micronesia). Critical vulnerabilities include the availability of freshwater, adverse impacts to coastal and marine ecosystems, and exposure to hazards including sea-level rise and inundation. Some climate impacts to Pacific Island communities include:

- Sea-level rise, higher sea temperatures, and ocean acidification associated with climate change further degrade coral reefs already stressed by overfishing and pollution. Their loss diminishes ecological heritage, shoreline protection, food supply from the sea, and results in a decline of income from ecotourism in the Pacific Island communities where tourism is one of the largest industries.
- Potential for extended drought, due to a change in rain-delivering weather systems. Due to the geographic isolation of the Pacific Islands and the challenges of delivering freshwater from other regions, a drought could have significant impacts on freshwater supply. A severe drought would impact water supplies for drinking water, agriculture irrigation, and industry. Critical freshwater and brackish habitats would likely be impacted.
- Increased intensity of typhoons, cyclones, and hurricanes has affected Pacific Islands significantly (e.g., typhoon Soudelor in 2015 and super typhoon Yutu in 2018). Climate change may bring more frequent and higher energy storms resulting in catastrophic damage to island infrastructure. This degree of damage could cripple the economies of Pacific Island communities for a significant period, not only impairing economic development but also the ability of local governments to ensure delivery of essential water, sewer, electricity, and other public services.
- Sea-level rise has multiple implications for Pacific Island communities:
 - For the low-lying atolls, entire islands may be submerged within a generation resulting in significant disruption of community societies and traditions, causing people to leave traditional locations, foods, and resources.
 - For some low-lying islands, sea-level rise can result in a wash-over in which islands, or portions of islands, are submerged by waves during significant storm events. Ocean washover results in saltwater contamination of agricultural lands, which would decrease land productivity significantly. This loss of agricultural productivity has an acute impact on the primarily subsistence-based economies of these communities.
 - Sea-level rise increases the potential for saltwater intrusion into the sole-source aquifers that many Pacific Islands rely on for drinking water. There are few or no readily accessible alternative drinking water options when a community is confronted with the loss of productivity of a sole source aquifer.
 - For many of the islands, sea-level rise has an immediate, accelerated impact on coastal erosion, which affects water quality, coral reef health, coastal infrastructure, available land, and culturally significant sites.
 - Some coastal buildings and infrastructure, including coastal hotels and tourist destinations, are becoming unsafe to use, reducing tourism dollars significantly.

- Hazardous and solid waste disposal site stability can be reduced by flooding and rising water tables, leading to potential waste releases into the groundwater and ocean.
- Wastewater treatment plants on or near the shore may be inundated with seawater, causing untreated waste to flow into neighborhoods impacting human health.

3.5. Vulnerabilities of Communities and Individuals

Vulnerable communities include those communities and individuals who are particularly susceptible to climate impacts such as tribes, indigenous communities, low-income communities, communities of color, children, the elderly, and people with chronic conditions and disabilities. Their location may be more likely to flood or experience heat events. They may have fewer resources that help them:

- prepare for and receive warnings of impending events (e.g., hurricanes, wildfires, floods);
- recover from impacts; and
- move away from high-risk locations.

Infrastructure and housing in traditionally underserved communities may be vulnerable due to outdated design and lack of funds for maintenance. This makes communities even more vulnerable to impacts from disasters. Some chronic health conditions such as asthma may be more prevalent for people in communities with chronic indoor or outdoor air quality issues. For example, flooding can cause mold to grow in homes, affecting mold-sensitive individuals. In addition, extreme heat and lack of access to on-site cooling or neighborhood cooling stations can put the health of elders and children at risk.

Where environmental justice issues are prevalent, climate-induced disasters (e.g., floods, hurricanes, wildfires) can exacerbate people's exposure to previously contained hazardous chemicals and pathogens that are transported in the water or air. For example, contaminated sites are often in communities that are overburdened by multiple environmental and public health issues. These communities are likely to bear more significant risks and burdens from climate-driven extreme events and to have a more challenging time recovering, given their lack of resources.

Some communities and individuals may be at greater risk from climate-induced natural disasters. They may be less likely to receive disaster warnings before a disaster strikes due to communication challenges (e.g., cell phone and internet coverage is limited in many rural communities). Communities that have many Limited English Proficient (LEP) individuals may not receive notifications that they can understand. Some communities have less access to transportation and therefore a reduced ability to evacuate.

Individuals with chronic conditions or disabilities may be at greater risk during or following natural disasters. Their disability may make it challenging to hear or see danger signs or warnings or may affect their ability to evacuate to a safe location. Chronic lung conditions may create compounding challenges for navigating in smoky wildfire conditions. These individuals may have additional support needs that can be taken into account when planning for disaster resilience.

Children and elders are especially susceptible to impacts from disasters, given that they may need assistance to prepare for and withstand disaster conditions. Their bodies may be less able to weather extreme conditions. Communities can consider the needs of children and elders when addressing disaster mitigation.

EPA acknowledges that communities are not homogeneous and, therefore, sweeping assumptions cannot be made about community vulnerabilities. As EPA strives to work with a community to build resilience to climate

impacts, we also strive listen to their needs and priorities and honor that multiple forms of knowledge (e.g., cultural, traditional, ecological, place-based) are essential to effective decision-making.

3.6. Vulnerability of the Effectiveness of EPA Programs

The effectiveness of EPA programs, and our ability to meet our mission to protect human health and the environment, is also vulnerable to climate impacts. The list below is a summary of some of the ways that the effectiveness of EPA programs may be at risk from climate impacts. Risks to regulatory programs include risks to our partners in tribal, state, territorial, local, and Federal agencies and programs.

- Regulatory programs (e.g., for air emissions and discharges to waters) may have to change assumptions about ambient conditions and achievable permit levels as:
 - Air and water temperatures grow warmer.
 - Pollution from wildfire smoke increases for air.
 - Pollution from burned watersheds increases (e.g., release of sediment and building/infrastructure pollutants into waters).
- Permits may need to have stricter limits to keep air quality and water quality at acceptable levels for human health and the environment.
- More staff time may be taken up with permit review, Federal project review and emergency response action may be needed as, for example:
 - Storms increase, leading to more sediment build up in navigation channels.
 - Federal agencies propose projects in order to build resilience to climate impacts, leading to more reviews by Environmental Review Staff.
 - Wildfires and typhoons increase, leading to more house-hold hazardous waste cleanups by Emergency Response staff.
- Permittees may have more trouble operating facilities, which could affect their ability to meet permit limits and operating standards; for example, sea-level rise and storm surges can adversely impact coastal stormwater systems, combined sewer systems, wastewater treatment plants, pump stations, and hazardous and solid waste landfills and other facilities.
- Wildfire, sea-level rise, and drought may impact effectiveness of a contaminated site's original remedy design, requiring staff time to redesign and funds to implement.
- More monitoring stations may be needed to sample air pollutant levels, to provide more accurate data, including real-time data for the public.
- Increase in storms and floods could lead to increased indoor air issues from mold, which could call for more staff time to reach out to communities to take action to protect and improve indoor air.
- Drought may impact water supplies for drinking water systems, especially those with access to already extremely limited ground water or surface water resources. Sea-level rise and storm surge may have the same effect in coastal areas. As groundwater tables grow deeper, water quality may worsen due to intrusion of brackish ocean water. This may require more work by EPA staff to collaborate with communities, and drinking water agency partners, to find solutions for small drinking water systems, including some tribes' and island communities' drinking water systems.

- Geographic shifts in pest populations may lead to the need for new chemicals and new application technologies, as well as applications in different locations and landscapes. This could apply to agricultural pests, structural pests, disease-carrying and disease-causing pests. In addition, rising sea level may require improved/modified/relocated storage facilities.
- Increase in intensity of wildfires, floods, hurricanes, and other climate-driven disasters presents risks to EPA employees and contractors engaged in field work such as sampling, remediation, and inspections.
- Stormwater systems may be impacted by floods at the same time groundwater may be impacted by droughts, potentially causing great stress on the health of watersheds and soils, and the quality of waters and habitat.

Note that climate impacts also require us to consider changing long-standing procedures so that we can build resilience and increase sustainability. This requires staff time and resources to plan, collaborate, and implement. For example:

- Rather than dumping dredged sediment at sea, we could use it beneficially to build coastal levees to protect infrastructure and wetlands as sea level rises.
- Rather than disposing of wastewater, we could use innovative water reuse procedures and alleviate some water supply issues.
- Rather than leaving buildings in the path of impacts, we could plan to move, raise, deconstruct and reuse buildings that will become uninhabitable due to sea-level rise.
- Rather than disposing of undamaged building materials in landfills after a portion of a property is impacted by a fire or flood, we could salvage the materials for reuse. This could also be done with salvageable downed timber that could be used to fulfill local high needs for building materials.
- Rather than shunting floodwater down paved waterways, we could install green infrastructure to slow and spread storm flows, nourish groundwater basins, and encourage private property owner rainfall capture and reuse.

3.7. VULNERABILITY ASSESSMENT SUMMARY

The impacts and vulnerabilities described above, to people, land and environmental programs, call for EPA to consider working even more collaboratively with our traditional partners in tribes, territories, states and communities (including community-based organizations) to reduce climate change and build resilience to climate impacts together.

4. CLIMATE ADAPTATION ACTIONS

EPA has described five National Cross-EPA Priorities for Climate Adaptation. The five priorities are:

1. Integrate climate adaptation into EPA programs, policies, rulemaking processes, and enforcement activities.
2. Consult and partner with tribes, territories, states, environmental justice organizations, community groups, businesses, and other Federal agencies to strengthen adaptive capacity and increase the resilience of the nation, with a particular focus on advancing environmental justice.

3. Implement measures to protect the agency’s workforce, facilities, critical infrastructure, supply chains and procurement processes from the risks posed by climate change.
4. Measure and evaluate performance.
5. Identify and address climate adaptation science needs.

CONSIDERING CLIMATE CHANGE IN BIPARTISAN INFRASTRUCTURE LAW FUNDING

Region 9 will take steps to ensure the outcomes of infrastructure investments using Infrastructure Investment and Jobs Act (IIJA, or Bipartisan Infrastructure Law [BIL]) funds are resilient to the impacts of climate change. Region 9 will explore opportunities to integrate climate change considerations into its financial assistance programs in order to expand support for projects that increase climate resilience while delivering co-benefits for public health, the mitigation of greenhouse gases, and the reduction of other pollution. Region 9 will also provide technical assistance to recipients of BIL funds to help them make climate smart infrastructure investments.

The Infrastructure Investment and Jobs Act (IIJA, or Bipartisan Infrastructure Law [BIL]) is a historic investment in the water infrastructure improvements, pollution cleanup initiatives, and workforce opportunities necessary to transform communities around the country. Much of the federal assistance provided through BIL will scale up EPA’s existing grant and loan programs, such as the State Revolving Fund Programs and Brownfields Grants. It will also be delivered through the creation of new low-interest financing programs, primarily for tribes and rural or disadvantaged communities. With this significant influx of capital from BIL, it will be more important than ever for EPA – and our state, tribal, and local partners – to invest in resilient infrastructure projects that withstand climate change for decades to come.

EPA’s National Program and Regional Offices will work through the programs that received BIL funding to encourage resilient infrastructure outcomes across the country. Internally, EPA is taking steps to consider how its policies, operations, and program activities can be better aligned to accelerate resilient infrastructure projects, with an emphasis on the most vulnerable communities. EPA will take steps to ensure that its financial assistance programs support resilient infrastructure investments that consider anticipated climate change impacts. It will also be critical that EPA’s technical assistance programs are readily accessible to stakeholders as they take intermediate steps to make climate-informed infrastructure investments. EPA will support its external partners by providing technical assistance opportunities for BIL-funded projects to help build their adaptive capacity. Consistent with the Agency’s Climate Adaptation Action Plan, EPA’s Offices will seek opportunities to engage with other federal agencies, external partners, and federal funding recipients to achieve climate-resilient infrastructure.

4.1. PRIORITY ACTIONS

EPA Region 9 has identified ten Priority Actions as shown in the following table and described further below. The table indicates how each action fits with one or more of the National Cross-EPA Priorities, in the action descriptions, below. The Priority Actions cover FY22, FY23, and beyond, which meets the EPA OP requirement to identify five Priority Actions for FY22 and five for FY23.

TABLE 1. EPA Region 9 Priority Actions for Climate Adaptation for FY22 and FY23

EPA Region 9 Division	Priority Action Title	FY 22 Priority for EPA R9	FY23 Priority for EPA R9	EPA Priority 1: Integrate CC into EPA Programs	EPA Priority 2: Build Resilience with Partners	EPA Priority 3: Protect EPA Staff and Facilities	EPA Priority 4: Measure and Evaluate Performance	EPA Priority 5: Identify Science Needs	Why is this a priority in EPA R9?
TIPD #1	Build Tribes' Climate Change Adaptation Capacity	x			x			x	Builds resilience of tribes. Action is a priority for our partners at BIA, and there is opportunity for collaboration.
TIPD #2	Host Binational and Borderland Climate Change Presentations with a Focus on Tribes and Communities	x			x			x	Builds resilience of communities. Uses EPA knowledge, skills and authorities. Action is a priority for partners in other agencies.
TIPD #3	Assist the Commonwealth of Northern Mariana Islands to Build Typhoon Resilience	x	x		x				Builds resilience of territory and its indigenous communities. Addresses a key climate impact (typhoons). Uses EPA knowledge, skills and authorities. Action is a priority for partners in other agencies.
OPA	Protect Children and Communities from Wildfire and Extreme Heat Effects	x	x		x				Builds resilience of communities and children and individuals with chronic conditions. Uses EPA knowledge. Addresses a key climate impact (wildfire). Supports priority of Western States Pediatric Env. Health Specialty Unit.
ARD	Reduce Exposure to Wildland Fire Smoke	x	x	x	x	x		x	Builds resilience of communities and individuals with chronic conditions. Builds resilience to key climate impact (wildfire). Identifies needed scientific research.
ECAD	Target Compliance Inspections to Facilities Vulnerable to Climate Change Impacts	x	x		x				Builds resilience of communities. Uses EPA knowledge, skills and authorities.
LCRD	Implement Climate Change Impacts on Remedy Resilience at RCRA and TSCA PCB Cleanup Sites and Permitted Facilities	x	x	x	x				Builds resilience of communities. Builds effectiveness of EPA programs, given climate impacts. Uses EPA knowledge, skills and authorities.
SEMD #1	Incorporate Climate Change Resilience into Remedy Selection and Protectiveness Determinations for Currently Listed Superfund Sites	x	x	x	x				Builds resilience of communities. Builds effectiveness of EPA programs, given climate impacts. Uses EPA knowledge, skills and authorities.
SEMD #2	Develop Contingency and Communications Plans for Private National Priority List (Superfund) Sites Vulnerable to Extreme Weather Events or Wildfire	x	x	x	x				Builds resilience of communities. Builds effectiveness of EPA programs, given climate impacts. Uses EPA knowledge, skills and authorities.
WD	Increasing Beneficial Reuse of Dredged Material as a Critical Climate Adaptation and Resilience Strategy	x	x		x				Builds resilience of communities. Builds effectiveness of EPA programs, given climate impacts. Builds resilience to key climate impact (sea-level rise). Uses EPA knowledge, skills and authorities.

TRIBES, INTERGOVERNMENTAL AND POLICY DIVISION

1. Build Tribes' Climate Change Adaptation Capacity

An EPA Region 9 Priority Action.

Timeframe – FY22.

Cross-EPA Priorities – #2 & #5.

Description – The Tribal Branch will provide technical assistance to tribes in Region 9 to develop and update climate vulnerability assessments and adaptation plans using General Assistance Program (GAP) grant funding for FY22 and identify such actions for FY23 grant workplans. To support development of assessments and plans in FY22, the Tribal Branch delivered a Climate Change webinar for tribes in Region 9 on September 23, 2021, providing guidance to tribal grantees on the use of GAP grants to fund development of vulnerability assessments and adaptation plans. The Tribal Branch will also provide technical assistance through identifying science needs and training needs with tribes around climate adaptation.

Climate Impact Addressed – Wildfires, storms, flooding, drought, food scarcity.

Co-benefits – This action can also build capacity of tribes to develop sustainable methods to address climate change issues.

Region 9 Lead – Ruben Mojica-Hernandez, Acting Branch Manager, Tribal Branch, TIPD.

Partners – Federally Recognized Tribal Governments in Region 9.

Performance metrics – The number of climate change related activities in Tribes' FY22 and FY23 workplans. For FY 22, Tribes will complete 3 plans and in FY 23, Tribes will complete 2 plans.

(including the number of tribes the GAP office provides assistance to for climate vulnerability assessment, climate adaptation and drought contingency plans).

Resource requirements – Using existing resources.

Challenges or barriers to accomplishing action – None identified.

2. Host Binational and Border Region Climate Change Presentations with a Focus on Tribes and Communities

An EPA Region 9 Priority Action.

Timeframe – FY22

Cross-EPA Priorities – #2 & #5

Description – Develop and hold two presentations (workshop and forum) at the Border Region that include Climate Adaptation and Climate Mitigation.

1. One presentation (a workshop) will be for the 24 Federally Recognized Tribes in the California and Arizona Border Region on the range of climate change impacts, adaptation and planning tools, and mitigation in their region. The webinar will be developed in partnership with other Federal agencies and expert organizations.
2. The second presentation (a forum) will be a binational event engaging with tribal leaders and tribal cultural specialists. The presentation will include climate adaptation planning and climate mitigation. Participants will share examples and create connections to replicate best practices for building resilience to climate impacts.

Climate Impact Addressed – Wildfires, heatwaves, sustained drought, extreme rain events.

Co-benefits – sharing information on climate mitigation planning.

Region 9 Lead – Mexico Border Branch, TIPD

Partners – CalEPA, ADEQ, SEMARNAT, and potentially NOAA and BIA

Performance metrics – 2 webinars

Resource requirements – Using existing resources.

Challenges or barriers to accomplishing action – Partners' availability.

3. Assist the Commonwealth of Northern Mariana Islands to Build Typhoon Resilience

An EPA Region 9 Priority Action.

Timeframe – FY22 - 26

Cross-EPA Priority – #2

Description – Provide extensive technical assistance through review of landfill design documents, planning documents, draft ordinances, position descriptions for new hires, workplans, and budgets for Federal grants for the Commonwealth of Northern Mariana Islands (CNMI). Provide funding assistance and technical assistance to the CNMI to repair and rebuild their solid waste infrastructure. Functioning solid waste programs and facilities build resilience to disasters, including typhoons. The PIO will administer up to \$10 million in grant funding for further repairs and upgrades to the Marpi landfill in Saipan in FY22, and work with the CNMI to support their effective management of \$56 million of funds by FY26. The PIO plans to share lessons learned from the CNMI's disaster recovery and expand and increase technical assistance to Guam (Chamorro populations) and American Samoa (Samoan populations) to build typhoon resilience.

Climate Impact Addressed – Typhoon

Co-benefits – Builds sustainability

Region 9 Lead – Michelle Baker, Pacific Islands Office (PIO), TIPD

Partners – EPA Region 9 LCRD and Brownfields; EPA Region 2; CNMI Bureau of Environmental and Coastal Quality (BECQ); CNMI Department of Public Works, CNMI Office of Planning and Development; Mayors Offices of Tinian and Rota; and the Integrated Solid Waste Planning Team with participants from Saipan, Rota, and Tinian

Performance metrics –

- Conduct 1 on-site Zero Waste training
- Provide technical assistance to the CNMI to complete the following deliverables:
 - Comprehensive Solid Waste Management Plan,
 - a Zero Waste feasibility report,
 - an Alternative Energy feasibility study for Marpi landfill.
- Provide grant administration to repair and upgrade the Marpi landfill in Saipan in FY22.
- The CNMI's full expenditure of award funds (\$56 mil) by FY26.
- The CNMI has functioning solid waste program by FY26.
- Expand/increase technical assistance to Guam (Chamorro populations) and American Samoa (Samoan populations) to build typhoon resilience.

Resource requirements – Using existing resources.

Challenges or barriers to accomplishing action – Ongoing pandemic-related impacts in Pacific Island territories (i.e., travel restrictions, resource constraints, staff shortages and losses) present unexpected and compounded challenges for Pacific Island environmental agencies in accomplishing both short and longer-term goals.

Additional Notes – The PIO is in constant communication with several Federal partners so that when opportunities for collaboration emerge, EPA can act on them. For example, PIO participates in monthly calls with the FEMA-hosted Federal Yutu Interagency Workgroup that includes all agencies with disaster relief funds. HUD is funding the Northern Marianas Housing Corporation with approximately \$250 million for home renovations and new construction. In addition, PIO provides the CNMI with green building and smart safe growth technical assistance. PIO will provide technical assistance to assist the use of zero waste management practices for new construction debris.

OFFICE OF PUBLIC AFFAIRS

4. Protect Children and Communities from Wildfire and Extreme Heat Health Effects

An EPA Region 9 Priority Action.

Timeframe – FY22-23

Cross-EPA Priority – #2

Description – EPA Region 9 will work on the following projects:

- In FY22, through a pilot project, help partners in Pima County, Arizona, and the San Francisco Bay Area develop steps and funding sources for retrofitting school HVAC systems to meet multiple goals. Goals include providing healthy air for students and school staff and providing neighborhood clean air and cooling shelters. EPA Office of Community Revitalization is the pilot project lead, in partnership with EPA Regions 9 and 10. Technical assistance will be provided directly from EPA and through contractors. EPA and its consultant team will have expertise in disaster policy, community engagement, and HVAC engineering. EPA will create an action plan to retrofit selected schools.
- Develop the children’s book, “Why is Coco Red” in FY22, focused specifically on wildfires. This is a multi-region collaboration. and is a sequel to “Why is Coco Orange.” Eileen Shanahan (Environmental Education Program) is the Region 9 lead for this item.
- Continue to collaborate with the EPA Region 9 Air and Radiation Division to encourage use of Air Quality Flags in more communities. Provide information to the communities on how the program works, and encouragement to adopt the program.
- Continue to collaborate with the EPA partner Western States Pediatric Environmental Health Specialty Unit (WSPEHSU). Promote the *Story of Health* E-book chapter on wildfires that was developed using EPA FY21 interagency agreement funds. Promote wildfire outreach materials. Collaborate on wildfire outreach and education opportunities. Support WSPEHSU research on children’s health impacts from wildfire smoke.
- Develop and support outreach and education, including webinars, emails, social media, videos, presentations, conferences/events educating the public (parents/caregivers, teachers, school staff, community members, public health workers, physicians) about wildfire (primary) and extreme heat (secondary) health impacts and steps they can take to protect children and other vulnerable populations in their communities.

Climate Impact Addressed – Wildfires, extreme heat

Co-benefits – A co-benefit is better indoor air quality for students and school staff throughout the year, even when there are not wildfires or heat events. This has positive implications for reducing COVID-19 transmission as well. Allows schools to stay open during wildfires and heat events, improving access to education.

Region 9 Lead – Sarah Sullivant, Children’s Environmental Health and Healthy Schools, Community Revitalization Section, Public Affairs Office

Partners – EPA Region 9 Air and Radiation Division; R9 Indoor Environments Team; EPA Region 9 Border Program; Office of Children’s Health Protection; Office of Air Quality Planning and Standards; Office of Community Revitalization; Office of Air and Radiation; Bay Area Air Quality Management District and its partners; Pima County Health Department and its partners; Western States Pediatric Environmental Health Specialty Unit; Schools, community organizations, and tribes participating in the Air Quality Flag Program

Performance Metrics –

- Number of schools set up as community cleaner air and cooling centers
 - Target: 2 by November 2022
- Number of new organizations enrolled in the Air Quality Flag Program each year
 - Target: 10 for FY22
- Number of views on four wildfire and health videos produced in FY21 in English and Spanish (continuing to promote)
 - Target: 20% increase in views for each video for FY22 = 1900 combined views
- Number of outreach/education events with content related to wildfires and/or extreme heat
 - Target: 5 for FY22
- Number of emails/social media posts related to wildfires and/or extreme heat
 - Target: 25 for FY22
- ‘Why is Coco Red?’ book development complete and published
 - Target: 1 by end of FY22

Resource requirements - Using existing resources.

Challenges or barriers to accomplishing action - Staff time, competing priorities, COVID-19 impacting travel and events, lack of consistent access to communication tools (e.g., GovDelivery for email delivery and analytics, and Zoom for simultaneous translation).

AIR AND RADIATION DIVISION

5. Reduce Exposure to Wildland Fire Smoke

An EPA Region 9 Priority Action.

Timeframe – FY21 - FY26.

Cross-EPA Priority – #1, #2, #3 & #5

Description – Climate change in the Pacific Southwest is increasing the frequency and intensity of wildfires. Federal, state, tribal, and local land managers are seeking to increase the acreage of prescribed and cultural fires to reduce the threat from wildfires in the future. Wildfires and prescribed/cultural fires, together referred to as “wildland fire,” produce smoke and degrade outdoor and indoor air quality, impacting the health of millions of people.

EPA Region 9 is leading a new Office of Air and Radiation Wildland Fire Smoke Sub-Lead Workgroup to promote agency-wide communication on smoke issues and expand the agency's capacity to provide consistent, science-based, effective tools and messaging to support the public in reducing exposures to wildland fire smoke. The specific goals and tasks are being developed. The workgroup is forming in FY22.

Climate Impact Addressed – Elevated concentrations of particulate matter (PM) in outdoor and indoor air, resulting from wildland fires.

Co-benefits – As exposures to smoke from wildland fires are reduced, human health will be protected.

Region 9 Lead – Niloufar Nazmi, Immediate Office, Air and Radiation Division.

Partners – Internal partners include OP, OCHP, OAQPS, ORIA, ORD and EPA Regions 1, 2, 4, 7, 8, and 10. External partners include US Forest Service, States, air districts, tribes, Western States Pediatric Environmental Health Specialty Unit, schools and impacted communities.

Performance metrics –

- FY22 - Convene Sub-lead Workgroup with representatives from multiple OAR program offices, regions and ORD.
- FY22 – Sub-lead workgroup to develop purpose, goals and tasks.
- FY22 - EPA Region 9 to assist with development and delivery of tribal training class addressing indoor air quality and post-fire cleanup after a wildfire.

Resource requirements – Using existing resources and need new resources.

Challenges or barriers to accomplishing action – Lack of dedicated staff time and funding. Recent loss of an EPA Region 9 subject matter expert. Unfunded multi-lingual communication needs. Lack of public access to internet resources, air filtration equipment and clean air shelters.

Additional notes – This action partially addresses two known air quality vulnerabilities of:

1. increasing particulate matter concentrations from more frequent and severe wildfires; and
2. worsening indoor air quality from wildfire smoke infiltrating homes and buildings, as identified in EPA's October 2021 National Climate Adaptation Plan.

ENFORCEMENT AND COMPLIANCE ASSURANCE DIVISION

6. Target Compliance Inspections to Facilities Vulnerable to Climate Change Impacts

An EPA Region 9 Priority Action.

Timeframe – FY22 - FY26

Cross-EPA Priority – #2

Description – Develop, or identify and utilize, an inspection targeting tool to identify facilities vulnerable to climate change.

Climate Impact Addressed – When non-compliance is identified at vulnerable facilities, we would consider seeking injunctive relief that helps address the effects of climate change.

Co-benefits – Enforcement and compliance assistance ensures regulated facilities operate according to environmental standards, protects vulnerable communities, and builds awareness of potential public health and environmental threats.

Region 9 Lead – Data Solutions Branch (Contact: David Wampler), ECAD

Partners – EPA HQ OECA inspection targeting staff, State agencies such as CalEPA, California Air Resources Board, and the California Water Boards.

Performance metrics – In FY23 complete development of a Region 9 inspection targeting tool. Starting in FY23, the number of inspections conducted using new targeting tool. ECAD will aim to conduct approximately 54 Clean Water Act inspections at facilities vulnerable to climate change.

Resource requirements – Using existing resources.

Challenges or barriers to accomplishing action – Limited inspection staff, funding.

LAND, CHEMICALS AND REDEVELOPMENT DIVISION

7. Implement Climate Change Resiliency into Remedy Protectiveness at RCRA and TSCA PCB Cleanup Sites and Permitted Facilities

An EPA Region 9 Priority Action.

Timeframe – Ongoing

Cross-EPA Priority – #1, #2

Description – Evaluate resiliency of remedies for cleanup sites and permitted facilities to withstand increased climate-change related risks associated with rising sea levels, storm surges, groundwater tables, tsunamis, and wildfires.

Sites at which PCBs are disposed in-place located in zones at risk for sea-level rise and storm surges of increasing intensity are subject to greater risk of temporary or permanent flooding, increasing the potential for PCBs to be mobilized. TSCA submittals to EPA for such sites typically do not consider increased risk from projected rising water levels in future years brought about by climate change. However, TSCA disposal-in-place remedies are intended to remain effective in perpetuity (or until the contamination is removed with EPA approval, as needed). Remedial decisions for PCB and RCRA sites or facilities often rely upon engineering controls, including pumps and electrical equipment, and physical barriers (e.g., hard caps, liners) to ensure protectiveness over time. In the past, our RCRA remedial and hazardous waste permit decisions were evaluated against 100-year flood levels anticipated from heavy rain events. EPA needs to ensure that both our RCRA and PCB cleanup site remedies and permit decisions are sufficiently resilient to withstand the combined effects of sea-level change and severe weather events, as well as increased risk of fire danger for select sites/conditions. EPA's October 2021 National Climate Adaptation Action Plan includes a commitment to develop/update national policy for remedy selection for RCRA and PCB cleanup sites to address sea-level rise. Anticipated tasks for this action include:

- For PCB cleanup sites, EPA Region 9 will evaluate the combined effect of sea-level rise and storm surge projections up to a 7-foot total water level within an 80-year timeframe at our sites as an interim guideline until EPA national policy is developed/updated. For RCRA sites and PCB permitted disposal facilities, EPA will, at minimum, evaluate the combined effect of sea-level rise and storm surge projections within the expected life of the remedy or permit expiration date (e.g., 30 years). Factors to consider include projected sea-level rise, projected groundwater table rise, projected rise in water levels from up to a 100-year storm, the levels and depths of contaminants to remain in soil or other media, susceptibility for release/mobilization of PCBs or hazardous waste from future changes in total water levels or wildfires, and potential future pathways of exposure and receptors.

- For sites at which climate change-induced factors pose an added threat to the long-term protectiveness of a disposal-in-place remedy or permitted disposal, EPA will consider whether our approval should be contingent upon alterations being made to the remedy, long-term site monitoring plan (including groundwater monitoring), and/or site contingency plan. For example, EPA applied resiliency measures at one facility by requiring pumps and electrical equipment to be housed on the second floor of a parking garage within an area that might be flooded due to sea-level rise and storm surge. EPA will also carry out Long-Term Stewardship reviews for cleanup sites and permitted facilities which incorporate climate change risk factors. Long-Term Stewardship reviews may include periodic re-evaluation of changes in site vulnerability to disasters (e.g., from updated climate change impact projections or countermeasures such as constructing or increasing the height of levee systems).
- Finally, EPA will carry out training for PCB and RCRA Project Managers in LCRD on how to evaluate sites/facilities and associated remedies for climate change impacts and ways to implement climate change resiliency into remedy protectiveness.

Climate Impact Addressed - Coastal Storm Surge, Sea-Level Rise, Groundwater Table Rise, Tsunami, and Wildfires.

Co-benefits – To the extent that efforts to address climate change resiliency in site remedies are paired with implementation of greener cleanups measures, this would have climate mitigation and sustainability co-benefits. (EPA Region 9 has a greener cleanups checklist tailored to PCB cleanup sites.)

Region 9 Lead - Karen Irwin, Corrective Action Office, LCRD Division

Partners – State agencies, tribal agencies, Responsible Parties

Performance metrics –

Quantitative:

- Number of PCB and RCRA Project Managers who attended training on how to evaluate sites or permitted facilities for climate-change driven future conditions.
 - FY22 **0** and FY23 **18**
- Number of new PCB cleanup site and facility permit applications evaluated for climate-change driven future conditions.
 - FY22 **1** and FY23 **2**
- Number of existing RCRA and PCB cleanup sites or permitted facilities that have received EPA approvals evaluated for climate-change conditions as part of long-term stewardship activities.
 - FY22 **1** and FY23 **1**

Qualitative:

- Identify types of climate change resilient remedies implemented at RCRA and PCB cleanup sites and permitted facilities

Resource requirements – Using existing resources.

Challenges or barriers to accomplishing action – Ensuring consistency with national guidance for PCB and RCRA sites to be developed by EPA Headquarters-led climate change adaptation workgroups. EPA Region 9 is participating on the workgroups.

SUPERFUND AND EMERGENCY MANAGEMENT DIVISION

8. Incorporate Climate Change Resilience into Remedy Selection and Protectiveness Determination for Sites Currently Listed on the National Priorities List (Superfund) in Accordance with CERCLA

An EPA Region 9 Priority Action.

Timeframe – FY22 and onward

Cross-EPA Priority – #1 and #2

Description – Consistent with CERCLA and the NCP, the Agency ensures protection of human health and the environment and in doing so may consider potential impacts of extreme weather events and changing climate conditions at Superfund sites to ensure the long-term integrity of response actions. The existing Superfund response selection and implementation process provides a basis to consider potential extreme weather impacts and sea-level rise and to act, as warranted, to increase remedy resilience. For example, the NCP provides nine criteria to evaluate remedial action alternatives prior to issuing a proposed plan for a given site [see 40 CFR §300.430(e)(9)(iii)]. Consideration of climate resilience should not be treated as a new criterion; however, some or all of the following five criteria may be relevant to evaluating a remedial action alternative’s climate resilience:

(A) Threshold criterion: Overall protection of human health and the environment.

(B) Primary balancing criteria:

- long-term effectiveness and permanence;
- reduction of toxicity, mobility or volume through treatment;
- short-term effectiveness; and
- implementability.

There are other opportunities in the existing CERCLA framework that provide opportunity to evaluate and adapt to the effects of climate change. In instances where remedial actions have been selected but not yet implemented, the remedial design phase may provide an opportunity to consider potential site and remediation system vulnerabilities and identify adaptation measures to help maximize climate resilience. Climate change should also be considered when making a protectiveness determination during the Five-Year Review process at sites with remedies in place. RPMs should gauge the impacts of climate change on existing remedies. Where the remedies may be impacted by the effect of climate change, make recommendations to enhance the effectiveness of the remedy or to evaluate new remedies that will ensure long-term protectiveness of human health and the environment.

Specific adaptation measures may be identified through an evaluation of the following considerations:

1. Assess the vulnerability of a remedial action’s components, including its associated site infrastructure and evaluate whether the long-term integrity of a selected remedy may be impaired by adverse effects of climate change. A site-specific analysis of the remedial action in light of current, forward-looking information on local or regional climate and weather regimes may be useful. For example, the assessment may include predictive information on future climate conditions, such as intensities and frequencies of extreme weather events over a timeframe corresponding to a remedy’s anticipated duration, including long-term monitoring.
2. Based on any potential vulnerabilities identified in (1) above, evaluate adaptation measures that increase the system’s resilience to a changing climate and ensure continued protectiveness of human health and the environment. Examples of climate resilience measures may include adapting a system’s operating parameters, such as installing equipment that enables offsite workers to remotely adjust or suspend operations during extreme weather events. Other measures may involve installing engineered structures that address vulnerabilities, such as elevation of onsite power supplies and enhanced erosion controls. Engineered structures also may help prevent transport of contaminated material across a site or to offsite areas during heavy or prolonged precipitation, thereby avoiding site recontamination due to stormwater runoff from offsite sources.
3. Implement adaptation measures, as needed, to ensure the long-term integrity of CERCLA remedial actions and their protectiveness of human health and the environment.

The anticipated tasks for each Fiscal Year include:

- **In FY22**
 - Develop list of NPL sites that are either in the Feasibility Study stage or undergoing a Five Year Review in FY22.

- Identify appropriate resources and training to assist technical staff with evaluations.
- Evaluate climate change vulnerabilities and resiliency of remedies as described above.
- **In FY23**
 - Develop list of NPL sites that are either in the Feasibility Study stage or undergoing a Five-Year Review in FY23.
 - Identify appropriate resources and training to assist technical staff with evaluations.
 - Evaluate climate change vulnerabilities and resiliency of remedies as described above.
- **In FY24**
 - Develop list of NPL sites that are either in the Feasibility Study stage or undergoing a Five-Year Review in FY24.
 - Identify appropriate resources and training to assist technical staff with evaluations.
 - Evaluate climate change vulnerabilities and resiliency of remedies as described above.

Climate Impact Addressed – flooding, wildfires, drought, hurricanes, sea-level rise

Co-benefits – Co-benefits of actions are site specific.

Region 9 Lead – Dana Barton, Assistant Director, Superfund and Emergency Management Division.

Partners – Stakeholders may include Department of Defense, tribes, or another Federal or private stakeholder or Potentially Responsible Parties at PRP-lead sites

Performance metrics – Number of sites where feasibility studies are completed. An initial estimate of the number of sites is:

- **In FY22** - Approximately seven sites will complete Feasibility Studies and eight sites will complete Five Year Reviews.
- **In FY23** - Approximately fifteen sites will complete Feasibility Studies and three sites will complete Five Year Reviews.
- **In FY24** - Approximately four sites will complete Feasibility Studies and fourteen sites will complete Five Year Reviews.

Resource requirements – Using existing resources.

Challenges or barriers to accomplishing action - PRP-lead sites will require an Enforcement element.

Additional Notes - Sources: MEMORANDUM Consideration of Climate Resilience in the Superfund Cleanup Process for Non- Federal National Priorities List Sites, Larry Douchand, Director, Office of Superfund Remediation and Technology Innovation USEPA. Additional impacts are anticipated but not completely understood.

9. Develop Contingency and Communications Plans for Private National Priority List (Superfund) Sites Vulnerable to Extreme Weather Events or Wildfire.

An EPA Region 9 Priority Action.

Timeframe – FY22 and onward

Cross-EPA Priority – #1 & #2

Description – In Region 9, wildfires, drought, sea-level rise, and other climate change-induced effects threaten or may impact the remedies at our Superfund sites. Many of these sites are in or near vulnerable communities, tribes, and/or territories. Some of these sites are in areas with valuable sensitive resources like endangered species, drinking water aquifers, or rivers that supply irrigation and drinking water supply.

The anticipated tasks for each FY include:

- **In FY22**
 - Complete development of contingency and communication plan template and requirements.
 - Develop list of sites that should be addressed and denote High Priority sites.
 - Complete Plan for each High priority site.
- **In FY23**
 - Review plan template and requirements for any needed updates.
 - Update existing plans as needed.
 - Review and evaluate if additional sites should be addressed.

- Complete Plan for each remaining site on the FY22 list and any new sites added.
- **In FY24**
 - Review and repeat.

Contingency and Communications Plans would likely follow the outline below and the following elements should be included to assist in bridging Removal/Remedial programs:

- Name and contact information of the site On Scene Coordinator.
- Contact information for any of the following that apply: local CAL FIRE office, police and/or Sheriff's office, fire department, property caretaker, neighboring property owner (if good working relationship exists), and city or county administration officials (Department of Public Health, Department of Emergency Services)
- Addendum to contingency plan: One-page site overview to be used to convey key information to internal or external parties with the following information:
 - Site location, basic figure with site boundaries, how to access the site (gate codes, keys, etc.) If access is complicated it should include step-by-step instructions with photos/google earth screenshots.
 - 2-3 paragraph site background/overview.
 - Key EPA personnel and associated contact information.

Climate Impact Addressed – flooding, wildfires, drought, hurricanes, sea-level rise, storm surges, etc.

Co-benefits – communities surrounding the NPL sites, build a collaborative partnership with Response stakeholders and local responders.

Region 9 Lead – Dana Barton, Assistant Director, Superfund and Emergency Management Division.

Partners – Several organizations host tools that will be useful in gathering the necessary data, performing geospatial comparisons, and prioritizing the information, including NOAA, USFWS, USGS, and the EPA.

Additionally, contingency planning involves emergency responders at federal, state and local levels. Some of the NPL sites are privately owned or operated.

Performance metrics – Contingency Plan in place for all private NPL sites **that are vulnerable to extreme weather events or wildfire** (In FY22 will have plans in place for high priority sites. In FY23, will have plans in place for all other private sites).

Resource requirements – Using existing resources.

Challenges or barriers to accomplishing action - FTE availability; all our RPMs are highly over-scheduled and finding the needed time will be challenging. In addition, coordinating review with the OSCs can be challenging.

WATER DIVISION

10. Increasing Beneficial Reuse of Dredged Material as a Critical Climate Adaptation and Resilience Strategy

An EPA Region 9 Priority Action.

Timeframe – FY22-FY26.

Cross-EPA Priority – #2

Description – As the coastal communities of Region 9 Plan for climate change and as sea level rises, it is vitally important that the millions of cubic yards of sediment dredged each year from ports, harbors and waterways be used beneficially for adaptation and resilience. The multiple benefits from reuse projects in augmenting habitat, rebuilding levees, and restoring wetlands are well known; but effective implementation for significant volumes of reuse has lagged significantly. The timing on this action is critical as many coastal areas must immediately begin beneficial reuse projects to adapt infrastructure to rising seas and to build ecological resiliency.

EPA Region 9 has long been a leader on this issue, establishing interagency policy and permitting frameworks to encourage/remove barriers to reuse (e.g., San Francisco Bay LTMS, Southern California DMMT). This action will require partnerships with tribes, states, other federal agencies, and project proponents to strengthen adaptive capacity and increase the resilience of the nation. Beneficial reuse actions will also advance environmental

justice through adaptation and resiliency of infrastructure in overburdened communities vulnerable to sea-level rise.

The work will follow this schedule:

FY22 - Strategic Planning and development of position paper.

FY22-23 - Dissemination of information; collaboration and implementation with partners; assessment of specific beneficial reuse opportunities.

FY23-24 - Facilitation and implementation of specific projects.

FY25-26 - Beneficial reuse MOA with USACE for EPA Region 9.

EPA Region 9 will develop a position paper to outline past/current/future needs (including scientific data needs), actions, and challenges to increase visibility of the issue internally and externally. EPA will use existing collaborative frameworks to lead our partners in policy matters, funding opportunities, and implementation. EPA Region 9 will leverage our MPRSA authorities with USACE to direct sediment from maintenance projects to beneficial reuse instead of ocean disposal. EPA will assess opportunities throughout California and the Pacific Islands for new work dredging to be beneficially reused in restoration projects and infrastructure and to facilitate efficient permitting of those projects.

Climate Impact Addressed – This action would provide adaptation to multiple climate impacts including sea-level rise, flooding, wildfire, and drought/heat.

Co-benefits – Beneficial reuse of dredge material would provide increased ecological refugia, natural barriers of protection for human-built environment, increased buffering from storms/flooding, and increased sink for carbon sequestration. Realized better cost-to-benefit ratios for environmental actions and public protection measures. This action would benefit coastal and floodplain communities, including overburdened communities, by increasing resilience and developing recreation areas and greenspace.

Region 9 Lead –Jennifer Siu, Wetlands Section, Water Division.

Partners –Internal: HQ OWOW workgroups on climate change through the 404 Program. External: California Regional Water Boards, BCDC, California Coastal Commission, NMFS, CDFW, USFWS, USACE, California Coastal Conservancy, Port of Long Beach, SFEI.

Performance metrics –

- **In FY22**
 - Develop strategic plan and position paper with identification of strategic goals, resource needs, and specific implementation actions with timelines and metrics.
 - Identify regulatory tools to require beneficial reuse instead of ocean disposal.
- **In FY22-23**
 - Disseminate position paper and implementation actions to 6 stakeholder and agency groups in collaboration with partners.
 - Identify 3 actions to promote efficiencies in beneficial reuse and restoration permitting.
 - Assess opportunities for beneficial reuse in 2-3 sites in Southern California and the Pacific Islands.
- **In FY23-24**
 - Facilitate the reuse of 1 million cubic yards (mcy) of material in SF Bay and 2 mcy in Southern California.
- **In FY25-26**
 - Seek to enter into a MOA with USACE to beneficially reuse 75% of all suitable material from projects in Region 9.

Resource requirements – Using existing resources and need new resources.

Challenges or barriers to accomplishing action – This action will need EPA management support and facilitation. Achieving the short-term goals requires continued multi-agency and partner coordination and advocacy in both policy and regulation. Long-term goals will likely need additional federal and state funding for sediment management and may require legislative or HQ policy changes at EPA and USACE.

Additional Notes - Beneficial Reuse has been an EPA Region 9 Wetlands Section focus for many years because of the considerable number of multi-beneficial environmental outcomes that can result from reuse projects. EPA Region 9's Water Division and Environmental Review Branch have collaborated extensively on this issue through grants, permitting, and NEPA review.

4.2. ADDITIONAL ACTIONS

In addition to the ten Priority Actions described above, EPA Region 9 has identified additional climate adaptation actions that we are already taking or will pursue in the upcoming years. Although these are not listed as Priority Actions for EPA Region 9, they are nonetheless important to our work to build resilience to climate impacts.

TRIBES, INTERGOVERNMENTAL AND POLICY DIVISION

11. Integrate Climate Mitigation and Adaptation into the Border 2025: US-Mexico Environmental Program through the cooperative agreement with the North American Development Bank

Timeframe – FY21-FY25

Cross-EPA Priority – #1

Description – The [Border 2025 Environmental Program](#) (Border 2025), is making climate mitigation and adaptation a priority through the following actions:

- Partner with program partners, including the North American Development Bank (NADB), and NADB grantees to share and promote program initiatives and projects addressing climate actions and practices via program newsletters, program binational task force and workgroups, and other binational academic, government, non-profit, and private sector venues.
- Develop NADB program request for proposal funding criteria with climate as a ranking priority for selection. In FY22, EPA Region 9 expects to award two water reuse adaptation strategy projects and six other projects with climate relevant benefits.

Climate Impact Addressed – Focus on drought, rising temperatures, extreme heat events, new disease vectors, more intense precipitation events; and other climate impacts in the US-Mexico Border region of California and Arizona.

Co-benefits – The program will include mitigation and adaptation actions and leverage opportunities to educate communities on the differences, as well as share opportunities to participate and share results with the public on projects that have both mitigation and adaptation co-benefits from the funded projects.

Region 9 Lead – Melissa Dimas, Border 2025, Mexico Border Branch, TIPD.

Partners – Border 2025 formal program binational partners, as well as, others community NGO, academic, and private sector organizations, in particular the 62 miles of the US-Mexico border region.

Performance metrics – Completion of Border 2025 newsletter articles, meetings and educational forums, and project specific outputs and outcomes. In FY22, EPA Region 9 expects to award two water reuse adaptation strategy projects and six other projects with climate relevant benefits in the Region 9 Border Region.

Resource requirements – Using existing resources.

Challenges or barriers to accomplishing action – Border 2025 does not currently have funds for this project but will seek funds through other EPA programs and seek external partners that would be interested in co-sponsoring with EPA.

12. Engage Tribal Border Workgroup in Dialogue on Climate Mitigation and Adaptation

Timeframe – FY22-FY25.

Cross-EPA Priority – #2

Description – EPA Region 9 Regional Tribal Operations Committee’s Border workgroup will host an annual workgroup meeting with a focus on climate adaptation and mitigation to inform, educate, and promote dialogue on climate change issues relevant to tribes in the US-Mexico border region. In FY22, the Tribal Border Workgroup hosted a session on “Impacts of Drought to Tribes” and one tribal speaker presented on a water reuse design as a climate adaptation strategy. In FY22-FY25, the Border Workgroup anticipates working with Tribal Environmental Directors, tribal climate experts, and others to identify and develop future workgroup topics of interest.

Climate Impact Addressed – All, especially increasing and sustained drought, heat waves, and increasing vectors of disease in the Southwest.

Co-benefits – The Workgroup topics may include adaptation and mitigation actions. The Workgroup will leverage opportunities to engage tribal communities in dialogue on actions that include both adaptation and mitigation.

Region 9 Lead – Emily Pimentel, RTOC Border Workgroup Co-Chair and Border 2025 Tribal Coordinator, Mexico Border Branch, TIPD

Partners – RTOC Border Workgroup Co-chair Camilo Perez (Pesticide Office Director for Cocopah Tribe) and Tribal Environmental Directors.

Performance metrics – Completion of Border Workgroup session and relevant newsletter articles and other outreach resulting from the Border Workgroup. Number of Federally Recognized Tribes supported by EPA to take action to anticipate, prepare for, adapt to, or recover from the impacts of climate change.

Resource requirements – Using existing resources.

Challenges or barriers– Border 2025 has limited funds that can be directly targeted to tribes, but future Border 2025 solicitations can include ideas that come from the border workgroup.

Additional Notes – The EPA Border Workgroup Region 9 co-chair will collaborate with the Border 2025 program Division team members to develop agenda topics based on selected Border 2025 grant projects awarded to tribes.

13. Binational Climate Mitigation and Adaptation Youth Forum

Timeframe – FY22-FY23

Cross-EPA Priority – #1

Description – Border 2025 will host a binational forum oriented towards youth (18-30 years old) to facilitate an exchange of information and ideas and opportunities to engage in climate action across the US-Mexico border communities. The forum would aim to develop binational youth alliances and project specific actions among Region 9 sister cities and among tribal and indigenous youth, in partnership with existing NGO’s and academic institutions focused on climate education and outreach.

Climate Impact Addressed – The activity would explore relevant climate impacts in the border, such as drought, heat waves, monsoons, and increasing vectors of disease in border communities. Mental health impact of climate change on youth.

Co-benefits – The program will include educational activities and discussions to understand the differences between mitigation and adaptation actions

Region 9 Lead –Mexico Border Branch, TIPD

Partners – Arizona Department of Environmental Quality, CalEPA, Climate Alliance

Performance metrics – Number of attendees.

Resource requirements – Using existing resources.

Challenges or barriers to accomplishing action – The youth forum could be planned to take place in Arizona or California or both depending on interest, possible partners, and resources.

Additional Notes – Based on interest from EPA Region 6 and EPA HQ’s this forum could be replicated border-wide.

14. Strengthen Adaptive Capacities of Pacific Island Territories

Timeframe – FY22 - FY26 and ongoing

Cross-EPA Priority – #2

Description –

The Pacific Islands are thousands of miles from the US mainland, have small populations, high poverty levels, unique legal relationships with the US and are greatly vulnerable to climate change impacts. They have fewer delegated programs and need additional technical assistance compared to states.

The EPA Pacific Islands Office (PIO) will deliver direct technical and financial assistance to three Pacific Island territory environmental agencies (American Samoa, Guam, the Commonwealth of the Northern Mariana Islands) through early and frequent coordination with responsible agencies. Annually, PIO manages approximately \$65 million in federal grants, interagency agreements, and contracts to support Pacific Island environmental protection programs for safe drinking water, clean water and air quality, and pollution prevention. PIO coordinates EPA's extensive technical assistance to the Pacific Island environmental agencies. In FY22 - FY26, this work will include mainstreaming climate adaptation activities into existing activities, workplan development and local decision-making processes in addition to supporting their ongoing environmental health protection priorities.

Climate Impact Addressed – Individual and compounded effects of decreasing precipitation; increasing storm intensity, ocean acidification and warming; and rising sea levels.

Co-benefits – Pacific Islands annually receive technical and financial assistance via DERA grants which also address climate mitigation. Increasing the adaptive capacities of Pacific Islands who also face disproportionate environmental burdens, may help to address interconnected social, economic, ecological, and institutional vulnerabilities.

Region 9 Lead – Elena Vaouli, Manager, Pacific Islands Office, TIPD

Partners – EPA Region 9 LCRD, WD, ARD, ECAD; American Samoa EPA, Guam EPA, CNMI Bureau of Environmental Quality & Coastal Division

Performance metrics -

Short-term metrics:

- Total EPA funds awarded to Pacific Islands annually
- Total EPA EJ-specific funds awarded to Pacific Islands annually
- # of Pacific Island regional meetings held with climate or EJ topics included annually
- # of relevant trainings or webinars delivered to Pacific Islands annually

Longer-term metrics:

- # of climate and EJ work plan commitments clarified, added or accomplished between FY22 - FY26.
- # of local programs with improved capacity to assess or address climate change risks by FY26
- # of people trained in climate change adaptation between FY22 - FY26

Resource requirements – Using existing resources.

Challenges or barriers to accomplishing action – Ongoing pandemic-related impacts in Pacific Island territories (i.e., travel restrictions, resource constraints, staff shortages and losses) present unexpected and compounded challenges for Pacific Island environmental agencies in accomplishing both short and longer-term goals.

15. Improve Climate Resiliency in the U.S. Freely Associated States of Micronesia

Timeframe –

FY22 - Fill U.S. Freely Associated States of Micronesia (FAS) Circuit Rider position

FY22- FY25 - Circuit Rider implements scope of work

Cross-EPA Priority – # 2

Description –

U.S. Freely Associated States of Micronesia (FAS) of the U.S.-Affiliated Pacific Islands are important to national security interests. The FAS include the Republic of the Marshall Islands, Republic of Palau, Federated States of Micronesia; and are particularly vulnerable to climate change. Protecting human health and environment is a shared responsibility of EPA and FAS government partners.

The EPA Pacific Islands Office will retain a "Circuit Rider" to provide direct and on-site technical assistance to improve climate resilience of the water, wastewater and solid waste sectors, and of environmental regulatory programs, in the FAS. This assistance will include capacity building to help protect community health from

climate-related impacts to limited yet critical environmental resources. Possible products may include the development of a sanitary survey program, trained environmental staff, and increased capacity for incorporating hazard mitigation and climate adaptation strategies in infrastructure planning and development.

Climate Impact Addressed – Individual and compounded effects of decreasing precipitation (drought), increasing storm intensity (typhoons), ocean acidification and warming, and rising sea levels.

Co-benefits – mitigation, sustainability, and address other socioeconomic vulnerabilities

Region 9 Lead – Elena Vaouli, Pacific Islands Office, TIP Division

Partners – EPA Region 9 WD, LCRD, SEMD; EPA OITA; DOI, DOS; FAS environmental government agencies

Performance metrics – EPA Region 9 hiring of Circuit Rider in FY22; Circuit Rider completes at least one one-site visit to six FAS jurisdictions (Palau, RMI, Chuuk, Kosrae, Yap, Pohnpei) by FY25; Circuit Rider submits mid-year and annual report to TIPD through FY25.

Resource requirements – Using existing resources.

Challenges or barriers to accomplishing action – COVID-related travel bans may cause delays in proposed timeline of work.

16. Promoting Adaptation Planning for Federal Projects through NEPA

Timeframe – FY22-23

Cross-EPA Priority – #2

Description – The Environmental Review Branch (ERB) reviews projects proposed on Federal lands or requiring Federal approval or permitting. Each review provides an opportunity to share adaptation-related tools and information with Federal agency partners, and, if appropriate, recommend that Federal agencies prepare (or implement) a climate adaptation plan.

Climate Impact Addressed – Drought, sea-level rise, floods, extreme temperatures, heat islands, wildfire,

Co-benefits – Improved air quality, water quality and watershed health. Address environmental justice issues.

Region 9 Lead – Jean Prijatel, Manager, Environmental Review Branch, TIPD

Partners – Federal agencies, state agencies, private project proponents seeking Federal authorizations

Performance metrics – Number documents reviewed. Each document reviewed will be assessed for whether or not climate adaptation was addressed. If not, an EPA comment letter will recommend the development of a climate adaptation plan, if warranted.

Resource requirements – Using existing resources.

Challenges or barriers to accomplishing action – The volume of documents not under EPA control. Other federal agency commitments not “owned” by EPA. ERB awareness of other EPA Region 9 programs’ priorities to share with federal agencies may be limited by their respective staffing limitations.

Additional Notes – This effort can

1. advance other programs’ plans for communities; and
2. draw from guidance/tools being developed by HQ Office of Federal Activities Climate Change Workgroup.

17. Field of Dreams: Tribal Collaboration to Protect Water Quality through Integration of Agricultural Practices and Programs

Timeframe – FY22 - FY23

Cross-EPA Priority – #2

Description – The Intertribal Agriculture Council (IAC) has initiated meetings over the last 2 years to convene stakeholders on fire management perspectives to inform prescribed burning practices with Traditional Ecological Knowledge. The most recent convening was in November 2021. This project is an effort to move from a conversation about what could be done, to a document providing a project roadmap. This will enable projects to be implemented on the ground, supporting tribal communities desire for local food access and reductions in wildfire risk.

In FY22, the Tribal Clean Water Act Section 319 and Environmental Justice programs will expand on the conversations on agriculture to include water quality protection in connection with fire management through workshops between stakeholders (tribes, IAC, NRCS, CAL FIRE) in California to increase knowledge of program intersections and barriers leading to a road map for implementation of effective projects. The final framework report will document the existing resources, integration of programs, barriers to address, and best practices. The purpose of the framework document is to assist California tribal environmental staff in understanding which federal agency can help them support water quality and agricultural goals for specific projects on tribal lands. Federal staff, as a secondary audience, will better understand how EPA and NRCS programs can work together for mutually beneficial outcomes for agency goals, while supporting the interests of tribes. There is potential scalability of this project in using the framework document for future work with NRCS, Intertribal Agriculture, and tribes in Nevada and Arizona and other EPA regions.

Climate Impact Addressed – Wildfire, Local Food Access

Co-benefits – Improved water quality and watershed health

Region 9 Lead – Alan Bacock, Co-Lead, Environmental Justice Program, TIPD

Partners – IAC, California tribes, Natural Resource Conservation Service

Performance metrics – Amount of convenings (3 in FY22), development of a framework document (1 in FY22), Engagement of additional states/tribes (2 in FY23)

Resource requirements – Using existing resources and need new resources.

Challenges or barriers to accomplishing action – The structure of the federal government creates silos which are difficult to break. This action is an attempt to overcome challenges to leverage programs. In addition, this project hinges on the desire of tribes to share knowledge to support shifts in federal and state practices for prescribed fire.

LAND, CHEMICALS AND REDEVELOPMENT DIVISION

18. Zero Waste and Green Building Assistance to Commonwealth of Northern Mariana Islands

Timeframe – FY22- FY26

Cross-EPA Priority – #2 & #4

Description - Provide technical assistance on Zero Waste and Green Building to CNMI, and \$56 M 2019 Disaster Relief Act funding assistance for solid waste management actions. Support capacity-building to hire and train CNMI staff. Leverage mainland and Guam Zero Waste and green building lessons to build success at CNMI. Work closely with an Inter-Agency Task Force, leveraging additional funding and collaboration opportunities, especially for resilient rebuilding actions led by HUD and FEMA.

Actions will include:

- FY22 - FY23 - capacity-building, hiring and training, compost pilot, green building standard implementation, and support for significant Zero Waste and Federal green housing contract awards.
- FY24 - FY26 - Ongoing technical assistance with EPA's Pacific Islands Office and Inter-Island and Inter-Agency Workgroups

Climate Impact Addressed – Typhoons and other high wind events, flooding, sea-level rise

Co-benefits – Climate mitigation benefits include reducing landfill methane emissions and building-related energy use. Other co-benefits include sustainable, local job creation, healthy soils, and development of disaster-resilient affordable housing.

R9 Lead – Michelle Baker, Pacific Islands Office, TIPD; and Timonie Hood and Steve Wall, Zero Waste, Solid Waste, and Green Building; LCRD

Partners – CNMI Office of Planning and Development (OPD) and Bureau of Environmental and Coastal Quality (BECQ), the Integrated Solid Waste Planning Team with participants from Saipan, Rota, and Tinian; FEMA, HUD, DOE and DOI Federal partners

Performance metrics – Hiring of CNMI staff, awards of Zero Waste contract funding, waste characterization study data, recycling rate and composting measurement, and new housing energy use (availability of this data is uncertain at this time).

Resource requirements – Using existing resources.

Challenges or barriers to accomplishing action. – Ongoing disaster and sea-level rise threats. Weak recycling markets make cost-effective recycling difficult; supply chain and labor shortages may be barriers to building new green housing.

Additional Notes - CNMI could serve as a model for other island and isolated communities who can adopt similar Zero Waste and resilient green building-related mitigation practices.

19. Disaster Debris Reduction to Build Resilience

Timeframe – FY22 - FY24

Cross-EPA Priority - #1 & #2

Description - Coordinate with federal and state agencies and train communities to develop plans to reduce the impact of disaster debris. In FY21 LCRD held the EPA Region 9 Resiliency and Natural Disaster Debris Virtual Workshops (July/August 2021) with an executive session introduced by EPA Deputy Assistant Administrator Waterhouse and EPA Region 9 LCRD Director Jeff Scott. The Workshops convened more than 75 national and regional experts (federal, state, local, NGO, and academic) to share ideas on actions to reduce, equitably plan for, and manage disaster debris, such as:

- update guidance to incentivize deconstruction and safe reuse of buildings impacted by sea-level rise and, when appropriate, disasters;
- improve resilient building siting and design, including not building in sea-level rise zones; and
- develop procurement guidelines.

Technical assistance for this topic supports community planning for moving buildings out of the way of impacts (e.g., sea-level rise and inland floods), and safely reusing and recycling materials in the process. Methods developed can also be used for debris reuse and recycling after some disasters and can build overall disaster resilience.

The following actions are planned:

- FY22 –
 - Develop internal Resiliency and Natural Disaster Debris Workshop summary document to support similar Agency workshop planning,
 - Develop external Workshop summary outcomes document and conduct outreach
 - Develop multi-agency workgroup(s) and begin to meet quarterly to address priority opportunities to improve planning for sea-level rise and post-disaster adaptation and resilience.
- FY23 – Develop and share R9 Federal Disaster Debris Resource document
- FY22 - FY24 – Organize at least one regional or national virtual training or webinar on disaster debris reduction topic prioritized by Region 9 stakeholders at the July August 2021 Workshops.

Climate Impact Addressed - All

Co-benefits - Climate mitigation results include reducing the amount of disaster debris generated and landfilled, reducing embodied carbon associated with producing and transporting new building materials for recovery and rebuilding, and reducing landfill methane emissions. Environmental Justice, public health and environmental benefits include reducing exposures to disaster debris dumping, landfills and trucking emissions and to demolition pollutants (i.e., lead dust, asbestos). Other benefits include local job creation, historic preservation, and provision of low-cost building materials.

Region 9 Lead – Timonie Hood and Richie Donahou; Zero Waste and Green Building Section; LCRD

Partners - EPA Office of Resource Conservation and Recovery (ORCR) through FY21 contract support; Federal, tribal, state, and local agencies; non-governmental, and academic partners. Region 9 communities vulnerable to sea-level rise (California, Hawai'i, Pacific Island territories, and coastal tribes) and riverine floods are key partners.

Performance Metrics - Number of disaster debris policies updated, number of people reached by online trainings and workshops annually, training evaluation data, and the number of disaster debris recovery documents produced.

Resource Requirements - Using existing resources and need new resources.

Challenges or Barriers to Accomplishing Action - federal and state policy change is needed to incentivize/allow post-disaster reimbursement for materials reuse, recycling, composting and circular economy procurement policies. Sea-level rise planning to move or reuse buildings is not being prioritized although buildings are already being demolished, and some disasters and types of debris have limited safe recovery potential (ash, lead-based painted and treated wood, etc.).

Additional Notes - Successful deconstruction and reuse models were documented after Hurricanes Katrina and Irene to create meaningful local jobs and recover local materials for rebuilding, as well as building disaster recovery sheds and resilient floodplain parks.

20. Resilient Building Design Guidance Document

Timeframe – FY23

Cross-EPA Priority – #1 & #2

Description – EPA Region 9 draft *'Resilient Building Design Guidance,'* identifies methods and best practices to make buildings and infrastructure more disaster-proof, and references lessons learned from the California Wildfires and Typhoon Yutu (e.g., replace wooden power poles with concrete poles). EPA Region 9 partnered with EPA HQ ORCR to make the document more nationally relevant by adding examples from other regions. EPA Region 9 will work with HQ to finalize the document with additional examples from other regions and the 2021 EPA Resiliency and Natural Disaster Debris Workshops. In FY23 EPA (EPA HQ ORCR and EPA Region 9) will publish the document and conduct webinar and conference outreach with HQ.

Climate Impact Addressed – All

Co-benefits – Reduces environmental justice impacts of losing homes, disaster debris dumping, and the spread of toxins through demolition dust in underserved communities. Reduces landfill methane emissions. Saves money on disaster recovery and rebuilding costs.

Region 9 Lead – Timonie Hood, Zero Waste & Green Building Section, LCRD.

Partners – FEMA, HUD, tribal, state, local, and Pacific Island agencies. Also, planners, architects, and builders via building codes relevant to their projects and use of guidance document.

Performance metrics – Resource downloads, number of participants at webinar and training outreach.

Resource requirements – Using existing resources.

Challenges or barriers to accomplishing action. – Ongoing need to update code and guidance references.

Limited community capacity and resources to adopt and implement recommended actions.

Additional Notes - Publication timeline is dependent on HQ.

21. Redevelopment of Contaminated Sites

Timeframe – FY22 through FY26

Cross-EPA Priority – #1

Description - Conduct outreach and promote redevelopment planning that considers climate change impacts and opportunities for adaptation when redeveloping contaminated sites, specifically in EJ communities. Use the tools of our Brownfields and Land Revitalization program, such as the Brownfields Assessment, Cleanup, Revolving Loan Fund, Job Training and 128(a) grants, Targeted Brownfields Assessment, and other technical assistance.

Examples include:

- **Sea-Level Rise/Flooding:** Focus on contaminated coastal, Bayshore and riverine properties that represent an increased risk profile due to sea-level rise and increased flooding. Support shoreline softening where appropriate.
- **Extreme Heat:** Incorporate sustainability features into redevelopment that decrease heat island impacts, such as green infrastructure, urban forestry, native landscaping, and outdoor shade structures.
- **Renewable Energy:** Outreach on renewable energy site reuse options that diversify energy options, such as renewable energy generation and electric vehicle energy storage and charging.

Climate Impact Addressed - Flooding, sea-level rise, extreme heat, power insecurity

Co-benefits - GHG reduction through transit-oriented development and EV infrastructure, renewable power generation, sustainable building design, economic growth, job creation, and environmental justice.

Region 9 Lead – Scott Stollman and Richie Donahou, Brownfields, LCRD

Partners – Communities

Performance metrics: The number of projects initiated and completed that incorporate the adaptation features discussed above.

Resource requirements – Using existing resources.

Challenges or barriers to accomplishing action - Redevelopment of brownfield properties happens outside of the EPA Brownfields program and can take many years to complete.

22. Underground Storage Tank and Aboveground Storage Tank Wildfire Guide

Timeframe – FY22 and ongoing

Cross-EPA Priority – #1 & #2

Description – EPA’s [Wildfire Guide: Preparation and Recovery for Underground and Aboveground Storage Tank Systems](#) is a resource for UST and AST oil owners and operators to

- design their systems to lower their risk from wildfires
- prepare for and respond to the catastrophic effects and environmental harm that may occur when an UST or oil AST system is burned
- help return their system to service as soon as possible.

The guide consolidates federal, state, non-governmental, and UST and oil AST industry resources. The Guide discusses using tools to determine an UST/AST’s level of risk, including:

- EPA’s UST Finder which can identify USTs that are potentially vulnerable to, or have been impacted by, wildfires and to identify UST proximities to populations and drinking water sources.
- FEMA’s National Risk Index which spotlights hazards and highlights social vulnerability and community resilience, and helps users better understand the natural hazard risk of their respective areas or communities.

EPA Region 9 provided case studies of wildfire impacts to UST Facilities in California from the 2018 Camp Fire, in addition to being part of the planning and review of the Wildfire Guide. The Wildfire Guide was just launched at the end of FY21, and is designed to be a companion to the [UST Flood Guide](#) , which similarly provides information for UST owners and operators to design their systems to reduce risk in the event of a threatened or actual flood. Although the Guide addresses USTs and oil ASTs affected by wildfire, some elements of the checklists may apply to other natural disasters as well.

FY22 - Conduct outreach and present guide to state, territory, and tribal partners at All Agencies Meeting.

Ongoing - Promote use of the Guide by the implementing agencies and owner/operators.

Climate Impact Addressed – Wildfire

Co-benefits – Minimize the economic impact on owner/operators, and environmental harm of UST facilities in the path of wildfires.

Region 9 Lead – Alison Fong and Kenneth Dixon, Underground Storage Tanks (UST) Program, LCRD

Partners – EPA Office of Underground Storage Tanks (OUST), ORD, Region 9, Region 10, States, and industry.

Performance metrics – Resource downloads, number of participants at all agencies, outreach.

Resource requirements – Using existing resources.

Challenges or barriers to accomplishing action – Support of state/territory/tribal program implementers in promoting the guide in outreach to owners/operators; ensuring owners/operators are aware of the guide before next fire season.

23. RCRA Financial Assurance

Timeframe – FY23

Cross-EPA Priority – # 1

Description – Include climate adaptation considerations in R9 RCRA financial assurance procedures and priorities. This would involve using hazard mapping to ensure financial assurance mechanisms are in place and

reporting discrepancies are addressed in a timely manner for facilities located within areas of higher climate risk (e.g., fire danger zones, storm surge or flood zones). Staff will pull data from RCRAInfo and work with states to address any Financial Assurance issues at flagged sites.

Climate Impact Addressed – wildfire, storm surge, inland flood

Co-benefits – Encourage RCRA facilities to make changes to their operations.

Region 9 Lead – Philip Kum, Section Manager, Planning and State Development Office , RCRA Branch, LCRD

Partners – State and territory Hazardous Waste organizations.

Performance metrics – Number of FA facilities with adaptation plans

Resource requirements – Using existing resources and need new resources.

Challenges or barriers to accomplishing action –technical expertise in mapping and pulling in multi-layer databases to assess data from RCRAInfo

24. RCRA Hazardous Waste Grants

Timeframe – FY22 – FY26

Cross-EPA Priority – #1

Description – Incorporate climate adaptation considerations into EPA RCRA Hazardous Waste grant guidance and subsequent workplans from states and territories. Individual RCRA programs (i.e., Permits, RCRA Corrective Action, and Enforcement) will come up with guidance and/or sample deliverables and negotiate actual grant deliverables with applicants.

Climate Impact Addressed – All.

Co-benefits – Would be applicable to the entire EPA Hazardous Waste program for each grant to states and territories.

Region 9 Lead – Philip Kum, Section Manager Planning and State Development Office, Grant Project Officers in the Planning and State Development Office, RCRA Branch, LCRD

Partners – State and territory Hazardous Waste programs.

Performance metrics – Grant workplan deliverables that take potential climate impacts into account.

Resource requirements – Using existing resources and need new resources.

Challenges or barriers to accomplishing action – May take collaboration and approval of grant language across EPA RCRA grant programs.

WATER DIVISION

25. Regulatory Actions for Wetland, Stream and Coral Reef Protection and Restoration

Timeframe – FY22 - FY24

Cross-EPA Priority – # 1

Description – Maximize wetland, stream, and coral reef protection and restoration through collaboration, technical and financial assistance, and the use of science and regulatory tools, such as:

- Leverage resources and technical assistance to protect aquatic resources.
- Use regulatory tools to improve water quality, reduce impacts to waters of the US, and improve compensatory mitigation.
- Engage in internal and external partnerships to further restoration and protection efforts.

Actions will include:

- FY22
 - Assess review process to increase efficiencies and prioritization.
 - Develop Strategic Plans for Wetland and Stream protection and Coral Reef Protection and Restoration
- FY23 -24

- Provide technical assistance, host internal and external seminars and outreach, engage in partnerships, support collaborative permitting efficiencies for restoration in Southern California and Hawai'i

Climate Impact Addressed – Sea-level rise, biodiversity crisis, ecosystem collapse

Co-benefits – These actions build natural climate adaptation and ecosystem resiliency.

Region 9 Lead – Hudson Slay, Juliette Chausson, and Russell Huddleston; Wetlands Section, Water Division.

Partners – Internal – HQ Office of Wetlands, Oceans and Watersheds; Climate Change and CWA Section 404 Workgroup; EPA National Coral Reef Team; External - US Army Corps of Engineers, California Regional and State Water Quality control boards, California Coastal Conservancy, US Coral Reef Task Force, Pacific Island Governments

Performance metrics –

- FY22
 - Review and comment on 12 new high-impact CWA 404 permits and NEPA documents, including major NEPA-404 actions.
 - Prioritize review of CWA 404 permits and NEPA documents based on impacts to Aquatic Resources of National Importance (ARNI), regional priorities, and EPA commitments around climate change and environmental justice.
 - Identify coral reef protection priorities and support development of water quality standards protective of coral reefs.
 - Develop a screening process for Public Notice comments to quickly elevate for response letter signature.
 - Develop CoralVision document to define climate change and environmental justice priorities and highlight regional staffing and resources needed to support coral reef protection.
 - Review and comment on ~10 Prospectus and Bank Enabling Instruments through the Interagency Review Teams (IRTs)
 - Make a presentation (internal and external) to highlight aquatic resources and importance of program efforts.
- FY22-24 –
 - Provide technical assistance to support the priorities of the US Coral Reef Taskforce working groups (watersheds, restoration, climate change, fisheries/habitat).
 - Determine local governments', tribes', and communities' interest in more information on the role of at-risk ecosystems (e.g., wetlands) in increasing their communities' resilience to climate change.
 - Provide outreach for understanding the Clean Water Act's geographic jurisdiction over wetlands and clarify under what conditions states or tribes can regulate wetlands where EPA lacks jurisdiction.
 - Provide interested partners with technical assistance to support work to protect these resources that may help protect communities (e.g., establish their own 'waters' definitions).
 - Support collaborative permitting restoration efficiencies in Southern California and Hawai'i.

Resource requirements – Using existing resources and need new resources.

Challenges or barriers to accomplishing action – Constant changes in Waters of the US and CWA 401 Rulemaking result in ongoing implementation and outreach challenges.

Additional Notes - This is a core responsibility of EPA and the EPA Region 9 Wetland Section.

26. Wetland Program Development Grants for Climate Resilience

Timeframe – FY22 - FY24

Cross-EPA Priority – #1

Description – The Wetlands Office reviews proposals and administers the grants for the Wetland Program Development Grants (WPDG). This program awards approximately \$3.5 M over two years to tribal and state governments to develop wetland program capacity. The WPDG program has been an important source of funding for climate adaptation on tribal lands. The 2021 Request for Applications (RFA) identified regional priorities of protecting special aquatic resources vulnerable to climate impacts and improving environmental conditions for tribes and other communities disproportionately affected by pollution and climate change. The Wetland Section will identify information gaps, develop outreach and information sessions for grantees, and determine regional priorities around climate change for the 2023 RFA. The goal is to encourage a diversity of submittals for the 2023 RFA that support wetland capacity around climate change priorities.

- FY22 – Identify information gaps, determine outreach strategy.
- FY22 – Provide grantee outreach webinar/seminar, develop regional climate priority for RFA.
- FY23 – Issue RFA.
- FY23 – FY24 – award WPDGs.

Climate Impact Addressed – Drought, biodiversity crisis

Co-benefits – This action builds sustainability through development of state and tribal wetland programs. When states and tribes have the information and tools to assess the condition of their wetlands, they can develop climate resilient strategies for protection of fisheries, water supply, wetlands, and streams.

Region 9 Lead – Sarvy Mahdavi, Wetland Section, Water Division

Partners – Internal – EPA Enhancing State and Tribal Wetlands Team; External – states and tribes in Region 9

Performance metrics –

- FY22 – Identify knowledge gaps, develop outreach strategy for WPDG to determine regional priorities for the FY23 solicitation and to increase knowledge of the grant solicitation process among underserved and disadvantaged communities. Metric: outreach webinar/seminar attendance of all States in Region 9 and at least five tribes.
- FY22 -23 - Convene Wetland Program Development Grants (WPDG) seminar to facilitate technology transfer and knowledge sharing. Metric: >95% FY21/22 grantee attendance.
- FY23 – WPDG Request for Proposals. Metric: Receive 10% of applications from states or tribes that did not apply in FY21; Receive 20% of applications from tribes or historically disadvantaged communities/governments.

Resource requirements – Using existing resources and need new resources.

Challenges or barriers to accomplishing action – Platform accessibility for webinars, seminars and conferences may be a barrier to accomplishing this action.

27. Build Preparedness, Monitoring and Response Capacity for Addressing Harmful Algal Blooms

Timeframe – FY22 and FY23

Cross-EPA Priority – #2

Description – EPA Region 9 will work with EPA HQ Office of Water (OW) and Office of Science and Technology (OST) to provide cyanobacterial Harmful Algal Bloom (HAB) preparedness and response outreach (i.e., informational webinars and workshops). The CWA 106 Water Pollution Control and the CWA 319 Nonpoint Source programs will continue to provide technical support and leverage award funding to support states and tribes with water quality monitoring that prioritizes HAB parameters when funding is available.

EPA Region 9 Tribal Clean Water Project Officers in the Water Division will take the lead in managing grants, coordinating with other Division and Sections, as appropriate, in providing technical assistance when needed. There will be a need to form intertribal partnerships and collaborate with the states (specifically California).

Climate Impact Addressed – Drought, rising temperatures, extreme heat events, wildfires.

Co-benefits – educational activities, capacity building to address HAB preparedness, monitoring and response, environmental justice, and public health benefits.

Region 9 Lead – Loretta Vanegas (Tribal Clean Water Section) and Sue Keydel (Watersheds Section), Water Division

Partners – EPA HQ OW and OST, EPA Region 9 states and tribes. Intertribal partnerships.

Performance metrics – Funding awarded to tribes for use towards HABs related preparedness, monitoring and/or response.

Resource requirements – Using existing resources.

Challenges or barriers to accomplishing action – EPA staff resources to provide outreach and technical support, and adequate funding

28. Tribal Listening Session to Discuss Climate Change Impacts

Timeframe – FY23

Cross-EPA Priority – #3

Description – Climate Change Impacts and implementing Best Management Practices (BMPs) to address these impacts, are a major concern with our tribal partners. Water Division’s Tribal Clean Water Section will take the lead. Specifically, the RTOC Clean Water Workgroup will raise the question during the quarterly workgroup meetings and will hold at least one session at a RTOC meeting.

Climate Impact Addressed – Wildfire, drought

Co-benefits – Tribal Networking and hearing from other tribes on their mitigation efforts.

Region 9 Lead – Danielle Angeles, Tribal Clean Water Section, Water Division

Partners – EPA Region 9 Sections and Divisions will communicate and coordinate. Will also collaborate with State partners.

Performance metrics – How many of our tribal partners attend and contribute.

Resource requirements – Using existing resources.

Challenges or barriers to accomplishing action – Needing to hold the session virtually during a pandemic makes communication more challenging, since many conversations tend to be more robust when meetings are held in person.

29. San Francisco Bay Delta Temperature Thresholds for Salmonids

Timeframe – FY22 - FY25

Cross-EPA Priority – # 1 & #2

Description – Work with EPA Region 10, ORD, OST, and NOAA Fisheries to provide technical support to California efforts to identify temperature thresholds that will protect migrating salmonids in the Central Valley watershed, particularly in the face of climate-related warming temperatures and reduced flows. Product may be a white paper or guidance, addressing both regulatory and non-regulatory approaches by federal and state water and fish management agencies.

Climate Impact Addressed – Drought, more extreme weather patterns, higher temperatures

Co-benefits – Aquatic resource protection, ecosystem resilience

Region 9 Lead – Brian Thompson, Watersheds Section, Water Division

Partners – Work with EPA Region 10, ORD, OST, NOAA Fisheries, US Geological Survey, California Water Boards, California Department of Fish and Wildlife,

Performance metrics –

- FY22 –
 - Engage ORISE Fellow to conduct literature review.
 - Engage State and Federal partners to refine problem statement and define product.
 - Produce road map for temperature threshold identification.
- FY23 -25 – implement road map.

Resource requirements – Using existing resource and need resources.

Challenges or barriers to accomplishing action – Collaborative effort will require staffing.

30. Build San Francisco Bay Resilience

Timeframe – FY22 and FY23

Cross-EPA Priority – #2

Description – Issue a Request for Applications (RFA) for the San Francisco Bay Water Quality Improvement Fund, soliciting proposals to restore wetlands, restore water quality, and implement green development practices that use natural hydrologic processes to treat polluted runoff around San Francisco Bay. Fund at least 5 projects/year.

Climate Impact Addressed – Sea-level rise, wetlands loss

Co-benefits – Water quality improvement, habitat creation, resilience building

Region 9 Lead – Luisa Valiela, Watersheds Section, Water Division

Partners – Continue to expand the existing eighty partners representing all levels of government, non-profit organizations, and other community stakeholders eligible to receive grant awards

Performance metrics – Funds leveraged; # acres restored; load reduction (for WQ projects)

Resource requirements – Using existing resources.

Challenges or barriers to accomplishing action. – limited staff resources to administer program

31. Transforming Shorelines through Nature-Based Shoreline Infrastructure

Timeframe – FY22 - FY23

Cross-EPA Priority – #2

Description – Provide funding and technical assistance to the Transforming Shorelines project that will:

1. build regional capacity for nature-based solutions through technical support and analyses;
2. advance a suite of NBS projects through design, permitting and implementation; and
3. advance water quality improvement approaches at the Oro Loma Horizontal Levee site.

In FY23 produce the nature-based shoreline infrastructure toolkit.

Climate Impact Addressed – Sea-level rise, habitat loss

Co-benefits – Build resilience of San Francisco Bay shoreline, improve water quality improvements, and create habitat.

Region 9 Lead – Luisa Valiela, Watersheds Section, Water Division

Partners – San Francisco Estuary Partnership, Bay Area One Water Network, University of California at Berkeley, East Bay Dischargers Authority, Oro Loma Sanitary District, Valley Water.

Performance metrics – Ability to leverage other funding sources such as the Clean Water State Revolving Fund and FEMA’s pre-hazard mitigation funds in support of the San Francisco Estuary Partnership’s Hayward Shoreline horizontal levee pilot project and the related “next mile” project.

Resource requirements – Using existing resources.

32. Promote Drinking Water and Wastewater Infrastructure Projects in the Pacific Island Territories that address Climate Adaptations

Timeframe – FY22 and ongoing

Cross-EPA Priority – #1 & #2

Description - Implement drinking water resource management in the territories through the construction of infrastructure projects that support resilience to drought and salt-water intrusion. Continue work with Rural Community Assistance Cooperation (RCAC) in CNMI to reduce water loss and thereby reduce the draw on the aquifer and salt-water intrusion. In Guam, EPA will continue to partner with the Department of Defense to drill monitoring wells to better manage Guam’s sole source aquifer.

Continue to work with the Department of Energy, US Army Corps of Engineers and FEMA to develop strategies to increase alternative energy sources and increase energy resilience for drinking water distribution in CNMI. The EPA Pacific Island Territories Infrastructure Program will encourage the use of solar power for water and wastewater treatment and the installation of anaerobic digestion of wastewater treatment sludge and food waste. In addition, EPA will explore how to assist Guam Waterworks Authority in controlling power surges that have been damaging drinking water well pumps.

Provide extensive technical assistance from EPA Water Division and through EPA contractors to assist in procurement, selection and review of final design, and selection and management of construction for the upgrade of Saipan's two wastewater treatment facilities. Functioning wastewater treatment facilities are critical to resilience to disasters, including typhoons.

Provide funding assistance (\$9.4 M) and technical assistance (\$1.4 M) to the Commonwealth Utilities Corporation in CNMI. In addition, will use Bipartisan Infrastructure Law (BIL) funding, when available, through FY26.

Climate Impact Addressed – Resilience to drought, salt-water intrusion, increased energy resilience, and extreme weather conditions.

Co-benefits – Build sustainable utilities in the territories. Strengthen relationships with partners in the territories to identify and fund climate impacts to water and wastewater utilities.

Region 9 Lead – Lily Lee, Section Manager; Tom Konner, Territories Lead; Infrastructure Section, Water Division

Partners – Territory Utilities: CNMI Commonwealth Utilities Corporation and Guam Waterworks Authority.

Federal Agencies: US Department of Energy, FEMA and US Army Corps of Engineers. NGOs: Rural Community Assistance Cooperation (RCAC).

Performance metrics – EPA Region 9 will evaluate progress by the timely and expeditious award of grant funds.

Resource requirements – Using existing resources and need new resources.

Challenges or barriers to accomplishing action – Need to build capacity within the territories to develop and oversee projects.

33. Promote Climate Adaptation Projects through the State Revolving Fund (SRF) Program.

Timeframe - FY22 - FY26

Cross-EPA Priority - #1 & #2

Description - This action will begin in FY22 and will be ongoing through FY26 to coincide with Bipartisan Infrastructure Law funding increases.

- The National State-EPA SRF Sub-Workgroup – EPA Region 9 will work with the National State-EPA SRF Sub-Workgroup to determine how to best use SRF funds for supporting wildfire mitigation, recovery, and resilience building, and encourage Region 9 States' pursuit of funds.
- Stormwater management and associated control of Sanitary Sewer Overflows (SSOs) – EPA Region 9 will work with states and territories to provide infrastructure grants that are focused on shoring up the states' and territories' wastewater collection systems, reducing infiltration and inflow (I&I), and associated Sewer System Overflows (SSOs). The focus is on building resilience to high precipitation events and more frequent and powerful storms, for wastewater collection system.

Climate Impact Addressed - All

Region 9 Lead – Lily Lee, Section Manager; Tom Konner, Territories Lead; and Liz Borowiec, SRF Lead; Infrastructure Section, Water Division

Partners – Territory Utilities: CNMI Commonwealth Utilities Corporation and Guam Waterworks Authority.

Federal Agency: US Forest Service.

Performance metrics - The timely and expeditious award of SRF grant funds to Region 9 states and territories, and subsequent grants and loans to communities for climate adaptation.

Resource requirements – Using existing resources and need new resources.

Challenges or barriers to accomplishing action – Need to build capacity within the Region 9 states and territories to develop and oversee projects.

34. Promote Tribal Drinking Water Infrastructure Projects that address Climate Adaptations

Timeframe – FY22 and ongoing.

Cross-EPA Priority – #1 & #2

Description – Using our EPA Region 9 Drinking Water Tribal Set Aside Guidance, the TDW team will prioritize drinking water infrastructure planning and construction projects that address critical water supply deficiencies,

water system resiliency and water conservation at tribal public water systems. EPA will conduct outreach to tribes and tribal utilities to promote project development. EPA will assist tribal utility staff to develop projects that meet funding criteria. Where projects do not meet DWTSA eligibility criteria, EPA will direct project proposals to appropriate state and Federal partners (e.g., IHS, State Water Board, USDA-RD, FEMA, etc). EPA will coordinate closely with state and Federal partners to identify eligibility gaps in project funding and prioritize the lead funding agency.

Project Examples include:

- Emergency power generation for tribal water and wastewater utilities to maintain water operations during a prolonged power outage.
- Planning and construction projects to develop new water sources.
- Water Efficiency Projects (e.g., installation of water meters, improved SCADA systems).

Will use Bipartisan Infrastructure Law (BIL) funding increases, when available, through FY26.

Climate Impact Addressed – Drought and wildfire

Co-benefits – Builds sustainable tribal water utilities. Strengthens relationship with state, Federal and tribal partners to identify and fund climate impacts to water utilities.

Region 9 Lead – Emmanuelle Rapicavoli, Team Leader; Nancy Sockabasin, Tribal Water Infrastructure Lead; and Andrew Sallach, Tribal Drought and Water Resiliency Coordinator; Tribal Drinking Water Team, Water Division

Partners – Tribal water utilities, Indian Health Service (IHS), California State Water Board, US Department of Agriculture - Rural Development (NRCS-RD), FEMA, RCAC.

Performance metrics – EPA Region 9 will evaluate progress by looking for an increasing trend from year to year:

- Number of project proposals addressing water resiliency received during DWTSA solicitation.
- Number of projects awarded funding.
- Dollar amount funded.
- Funding leveraged with external partners.

Resource requirements – Using existing resources and need new resources.

Challenges or barriers to accomplishing action – Limited infrastructure funding. Tribal capacity to develop and oversee projects. Limited staffing at IHS.

35. SDWA Section 1420 - Promotion of Asset Management

Timeframe – FY22 - FY23

Cross-EPA Priority – #1 & #2

Description – Build drinking water system resiliency to achieve sustainable infrastructure and water delivery through informed decision making, efficient maintenance and operations and improved financial management resulting in prolonged asset list, reliable delivery of customer needs, ensure cost recovery, regulatory compliance, and improved emergency response to natural incidents.

Section 1420(c) of the Safe Drinking Water Act (SDWA) was amended upon passage of the America's Water Infrastructure Act of 2018 (AWIA) requiring state drinking water primacy agencies to include, a description of how the state will encourage asset management practices in their capacity development strategies for building the capability of water systems.

SDWA §1420(c)(2)(F) expands the capacity development strategy framework to require states to include a description of how the state will:

- encourage Public Water Systems to develop asset management plans that include best practices for asset management; and
- assist, including through the provisions of technical assistance, Public Water Systems in training operators or other relevant and appropriate persons in implementing such asset management plans.

States who receive Drinking Water State Revolving Fund (DWSRF) capitalization grants must submit a revised capacity development strategy by December 31, 2022. See the 9/19/2021 [letter](#) from EPA to the Association of

State Drinking Water Administrators (ASDWA) that extended the deadline. EPA will have 120 days from submittal to review and make a determination to approve to disapprove. If disapproved, EPA will withhold 20% of FY23 State DWSRF capitalization grant allotment.

Climate Impact Addressed – All.

Co-benefits – Efficient maintenance and operations, improved financial management, reliable delivery of customer needs, cost recovery, regulatory compliance, and improved emergency response.

Region 9 Lead – Corine Li, Section Manager, Drinking Water Program, Water Division

Partners – EPA Headquarters, states, Technical Assistance Providers (Environmental Finance Centers, Rural Water Association and Rural Community Assistance Corporation).

Performance metrics – State plans have milestone dates for development and delivery of revised capacity development strategies.

Resource requirements – Using existing resources

Challenges or barriers to accomplishing action – Competing staff workload for both EPA and states.

Additional Notes - Significant fiscal implication for states. EPA to approve revised state capacity development strategies by December 31, 2022, to avoid a 20% withhold of DWSRF grant allotments.

36. SDWA Section 1433 – Risk and Resiliency Assessments and Emergency Response Plans

Timeframe – FY22 and repeat every 5 years.

Cross-EPA Priority – #1 & #2

Description – Identify drinking water system vulnerabilities and promote increased resilience to natural hazards. System assessments shall assess the risks to, and resilience of, its system to include:

- the risk to the system from malevolent acts and natural hazards;
- the resilience of the pipes and constructed conveyances, physical barriers, source water, water collection and intake, pretreatment, treatment, storage and distribution facilities, electronic, computer, or other automated systems (including the security of such systems) which are utilized by the system;
- the monitoring practices of the system;
- the financial infrastructure of the system;
- the use, storage, or handling of various chemicals by the system; and
- the operation and maintenance of the system.

The assessment may include an evaluation of capital and operational needs for risk and resilience management for the system.

What: Section 1433 of the Safe Drinking Water Act (SDWA) was amended upon passage of the America's Water Infrastructure Act of 2018 (AWIA) to require drinking water utilities serving greater than 3300 persons to conduct risk and resilience assessments (RRAs) and update their emergency response plans (ERPs). The law specifies components that the risk assessments and ERPs must address and establishes deadlines by which water systems must certify to EPA, the completion of the risk assessment and ERP.

Who: Community water systems serving greater than 3300 persons must certify completion of their revised RRAs and ERPs in accordance with established statutory deadlines and to review and certify their RRAs and ERPs every five years.

EPA will provide training and technical assistance and ensure compliance with the statutory deadlines.

- FY22 – November 8-9, 2021. ERP Workshop for small systems.
- FY22 – Compliance monitoring and assistance.

Climate Impact Addressed – All

Co-benefits – Efficient maintenance and operations, improved financial management, reliable delivery of customer needs, cost recovery, regulatory compliance, and improved emergency response.

Region 9 Lead – Samantha Bishop, Drinking Water Program, Water Division; and Corine Li, Section Manager, Drinking Water Program, Water Division

Partners – EPA Headquarters, states, Technical Assistance providers (Rural Water Association, Rural Community Assistance Corporation)

Performance metrics – EPA HQs national database tracking, and regional compliance monitoring, assistance, and enforcement, as needed.

Resource requirements – Using existing resources.

Challenges or barriers to accomplishing action – Competing staff workload, at both EPA and states.

37. Aquifer Recharge and Aquifer Storage and Recovery

Timeframe – FY22 and ongoing

Cross-EPA Priority – #2

Description – Groundwater Protection Section staff will provide technical and regulatory guidance and assistance to states, local governments, and others for aquifer recharge (AR) and aquifer storage and recovery (ASR) projects. These projects are intended to recharge depleted aquifers and store water (potable water, stormwater runoff, treated wastewater, etc.) underground as an enhanced water resource management approach in response to changing climatic conditions. With an increase in interest for AR and ASR projects there is a need for state/local regulators and project proponents to have technical and regulatory support to ensure projects comply with federal regulations and standards (e.g., Underground Injection Control regulations) and that underground sources of drinking water are protected. Through this action EPA Region 9 will consult and partner with states, tribes, territories, environmental justice organizations, community groups, businesses, and other federal agencies to strengthen adaptive capacity and increase the resilience of the nation, with a particular focus on advancing environmental justice.

Climate Impact Addressed – Drought, seasonal flooding

Co-benefits – N/A

Region 9 Lead – David Albright, Section Manager; Groundwater Protection Section (UIC program); Water Division.

Partners – Local agencies (cities and sewer districts) fund, implement and manage the AR and ASR projects. The state agencies are the primary regulators of AR and ASR Projects. EPA oversees state regulatory actions and provides regulatory guidance and technical assistance. The Ground Water Protection Council (GWPC) is a nonprofit 501(c)6 organization whose members consist of state groundwater regulatory agencies that come together within the GWPC organization to mutually work toward the protection of the nation’s groundwater supplies. GWPC established the Aquifer Storage and Recovery - Managed Aquifer Recharge (ASR-MAR) Workgroup to serve as a forum for Federal, state, tribal, and local government, organizations and public interest, and professional organizations to exchange information, views, and ideas, and to communicate and collaborate on efforts concerning ASR and MAR issues or topics.

Performance metrics – inventory of AR and ASR wells.

Resource requirements – Need new resources.

Challenges or barriers to accomplishing action – Limited staffing in the EPA Region 9 Groundwater Protection Section.

38. Draft the Region 9 Disaster Mitigation Strategy

Timeframe – FY22

Cross-EPA Priority – #2

Description – Water Division and other Region 9 Divisions developed the EPA Region 9 Disaster Mitigation Strategy to identify current and potential disaster mitigation work in the Region. EPA Region 9 developed Standard Operating Procedures and formed a cross-Divisions Disaster Resilience Team (DRT), in accordance with EPA Order 2074: US EPA National Approach to Disaster Mitigation and Recovery (November 2020). The EPA Region 9 DRT developed the EPA Region 9 Disaster Mitigation Strategy to identify current disaster mitigation actions and increase the effectiveness of EPA Region 9 programs in building resilience to future disasters. As climate adaptation actions are often the same as disaster mitigation actions, building our disaster mitigation capacity serves to build our climate adaptation capacity.

Climate Impact Addressed – All climate-related natural disasters such as wildfire, typhoon, flood, and drought.

Co-benefits – Communities that are prepared for natural disasters and climate impacts are more sustainable; and EPA programs that think ahead about disasters can be more effective when disasters occur.

Region 9 Lead – Suzanne Marr, EPA Region 9 Disaster Mitigation Coordinator, Water Division.

Partners – Scott Stollman and Richie Donahou, the EPA Region 9 Disaster Recovery Coordinators; LCRD; the EPA Region 9 Disaster Resilience Team; and the EPA Region 9 Divisions.

Performance metrics – Complete the EPA Region 9 Disaster Mitigation Strategy

Resource requirements – Using existing resources.

Challenges or barriers to accomplishing action – NA

MISSION SUPPORT DIVISION

39. Maintain Higher MERV Rating Air Filtration for EPA Region 9 Buildings

Timeframe – Ongoing for foreseeable future

Cross-EPA Priority - #3

Description - EPA Region 9 installed improved filters with a higher MERV rating within building ventilation systems at EPA Region 9's Main Office (75 Hawthorne Street in San Francisco, CA), and the Los Angeles (CA) Field Office. In FY22 these filters are changed out quarterly. This maintenance with higher rated filters will continue into the foreseeable future. The MERV 13-rated system filters out harmful smoke that can be generated from northern California wildfires. In addition, improved filters with boosted ratings (though not as high as MERV 13) replace filters in the following EPA Region 9 facility locations: Pacific Islands Contact Office in Honolulu (HI), San Diego (CA) Border Office, Signal Hill (CA) Warehouse, and the San Francisco (CA) Warehouse.

EPA Region 9 occupies several properties. The main office is in San Francisco (CA) with much smaller office space in Los Angeles (CA), San Diego (CA) and Honolulu (HI). Warehouse and laboratory space is in San Francisco (CA) and Signal Hill (CA). The Richmond (CA) laboratory space is being closed with some functions moving to the EPA Office of Research and Development (ORD) Corvallis (OR) laboratory. Other functions are moving to the Field Support Service Center being built out in Hayward (CA). Each of these EPA Region 9 spaces is either in a Government Service Administration (GSA) owned building (Honolulu and San Diego), or under a GSA lease (Los Angeles, Signal Hill, Hayward and both San Francisco locations). The Corvallis laboratory is managed by ORD and is located outside of Region 9. As the properties in Region 9 are either owned or leased by GSA, GSA is the best situated to identify climate vulnerabilities and climate adaptation actions. EPA at the national level could consider pursuing a collaboration with GSA on property assessments and adaptation action identification.

EPA Region 9 understands that staff may be exposed to climate-related conditions such as wildfire smoke and extreme heat. This can occur for office staff or field staff. Building air filters (discussed above) and the ability to work from home can reduce exposure to wildfire smoke. Field staff receive safety training that includes information on how to protect themselves from exposure to wildfire smoke and extreme heat. For example, staff have access to information on avoiding heat stress. EPA Region 9 provides field staff with the 'Health and Safety Guidance for R9 Personnel Conducting Fieldwork During Wildland Fire Smoke Events'.

Climate Impact Addressed - Wildfire

Co-benefits – Improved indoor air quality and virus filtration

Region 9 Lead – Laura Bloch and the Facilities Office, Infrastructure Services Branch, MSD

Partner – US General Services Administration

Performance Metrics - Maintain the Higher MERV Rating Air Filtration at the San Francisco (CA) and Los Angeles (CA) offices.

Resource Requirements – Using existing resources.

Challenges or barriers to accomplishing action - NA

5. CLIMATE ADAPTATION TRAINING PLAN AND NEEDS

EPA Region 9 has identified a training plan for EPA staff for climate adaptation. We have also identified external training opportunities for EPA partners. Some of these items are included in the previously described Actions in this plan, as noted. EPA Region 9 envisions that these planned trainings will enhance staff and partner awareness and knowledge of relevant climate impacts, and climate adaptation approaches to build resilience. As requested by Office of Policy, EPA Region 9 is providing an estimate of the timeline and measures for evaluating progress.

In addition, EPA Region 9 is listing training needs, to identify training interests we share with other EPA Regions that may be addressed nationally or addressed in collaboration with external partners.

5.1. Training Plan

5.1.1 Training Plan for EPA Staff

1. Climate Impacts and Incorporating Climate Change into EPA Programs: Collection of EPA National Program Trainings

Target Audience: EPA Staff.

Purpose: These National Program trainings on climate impacts and climate adaptation are to increase staff's knowledge and support them to be more effective in implementing their EPA programs as the climate changes. Topics may include specific EPA programs or broader topics such as Traditional Ecological Knowledges (TEK).

Training Development & Delivery Team: EPA HQ, in collaboration with regions

Timing: FY22 and thereafter.

Measures: How many EPA staff attend trainings relevant to their own program (if attendance can be measured).

2. Evaluating RCRA and PCB Sites and Facilities for Climate Change Impacts and Options for Incorporating Climate Change Resilience into Remedy Protectiveness

Target Audience: EPA Region 9 RCRA and PCB Project Managers

Purpose: To learn to evaluate sites and remedy selection for climate related contingencies. See Priority Action #7, above.

Training Development & Delivery Team: EPA Region 9 Corrective Action Section, LCRD; and HQ OLEM

Timing: FY22

Measures: How many EPA staff attend.

3. Incorporating Climate Change Resilience into Remedy Selection and Protectiveness Determination for Sites Currently Listed on the National Priorities List (Superfund) in accordance with CERCLA

Target Audience: EPA Region 9 technical staff in SEMD

Purpose: To increase knowledge of technical staff so that they can effectively evaluate climate resilience for NPL sites that are either in the Feasibility Study stage or undergoing a Five-Year Review. See Priority Action #8, above.

Training Development & Delivery Team: EPA Region 9, SEMD.

Timing: FY23 & FY24

Measures: How many EPA staff attend

4. Region 9 Quarterly Climate Impact and Adaptation Webinar Series

Target Audience: EPA Region 9 staff.

Purpose: To increase staff knowledge of EPA Region 9 climate adaptation work and knowledge of climate impacts and climate adaptation tools, resources, and trends in Region 9. Presenters will be from inside and outside of EPA. We will also invite EPA staff from other Regions, HQ, or ORD to present, as appropriate.

Training Development & Delivery Team: EPA Region 9 Climate Adaptation Group and associated colleagues.

Timing: Quarterly, beginning by end of FY22.

Measures: Number of staff attending and number of EPA Region 9 programs presenting.

5. Region 9 Working Effectively with Tribal Governments on Climate Change

Target Audience: EPA Region 9 staff

Purpose: To increase staff knowledge on current EPA programs and funding to support tribal climate change work, the session will cover case studies on tribal vulnerability assessments and adaptation planning. Effective outreach strategies to tribes on funding and technical assistance will also be covered.

Training Development & Delivery Team: EPA Region 9 Climate Adaptation Group and associated colleagues

Timing: FY22

Measures: Number of staff attending and number of EPA Region 9 programs presenting.

5.1.2. Training Plan for EPA Partners

6. Border Region Webinar for Tribes on Climate Adaptation and Mitigation

Target Audience: The 24 Federally Recognized Tribes in the California and Arizona Border Region.

Purpose: To provide information on the range of climate change impacts, adaptation and planning tools, and mitigation in the region. See Priority Action #2, above.

Training Development & Delivery Team: EPA Region 9, Mexico Border Branch, TIPD, in collaboration with the Institute for Tribal Environmental Professionals and others.

Timing: FY22

Measures: How many tribes attend.

7. Border Region Forum for Cross-Border Tribal Leaders and Tribal Cultural Specialists that includes Climate Adaptation and Mitigation

Target Audience: Border Region local governments and communities, in California and Arizona, with an emphasis on disadvantaged communities.

Purpose: To provide information on climate adaptation planning and climate mitigation through sharing examples and creating connections to replicate best practices for building resilience to climate impacts. See Priority Action #2, above.

Training Development & Delivery Team: EPA Region 9, Mexico Border Branch, TIPD, in partnership with Tribes and Cultural Specialists.

Timing: FY22-FY23

Measures: How many people attend.

8. On-Site Zero Waste and Green Building Training at the Commonwealth of the Northern Mariana Islands

Target Audience: Commonwealth of Northern Mariana Islands environmental department staff and other territory and local department staff. See Priority Actions #3 and # 18, above.

Purpose: To increase technical ability and program capacity for CNMI for waste management, which will increase resilience to typhoons.

Training Development & Delivery Team: EPA Region 9, Pacific Islands Office, TIPD, and Zero Waste Section, LCRD, in partnership with CNMI

Timing: FY23, assuming pandemic restrictions are lifted for travel to the Pacific Islands.

Measures: How many staff attend.

9. Disaster Debris Reduction to Build Resilience

Target Audience: Tribal, state and local agencies.

Purpose: Increase knowledge and capacity of EPA partners to develop plans to reduce the impact of disaster debris after a climate-related natural disaster and increase knowledge on the opportunity to move buildings out of the way of climate impacts, while safely reusing materials in the process.

Training Development & Delivery Team: EPA Region 9, Zero Waste Section, with EPA partner agencies and academics.

Timing: FY24

Measures: How many EPA partners attend.

10. Resilient Building Design Guidance Document Training

Target Audience: Tribal, state and local agencies.

Purpose: Increase knowledge and capacity of EPA partners to make buildings and infrastructure more resilient to natural disasters, referencing lessons from the California Wildfires and Super Typhoon Yutu.

Training Development & Delivery Team: EPA Region 9, Zero Waste & Green Building Office, LCRD, and HQ ORCR

Timing: FY23

Measures: How many EPA partners attend.

11. Use of the Underground Storage Tank Finder National Map to assess climate change impacts on UST facilities and leaking UST sites.

Target Audience: Program staff and managers from state, tribal and territory UST programs in Region 9.

Purpose: To assess climate change impacts on Underground Storage Tanks (UST) facilities and leaking UST (LUST) sites. The training will demonstrate how to use the layers on the mapping tool to assess climate change impacts to facilities.

Training Development & Delivery Team: EPA Region 9, Underground Storage Tanks Section, LCRD, using mapping tool developed by HQ.

Timing: FY22

Measures: Number of attendees.

12. Resources Available in the Recently Released EPA UST/AST Wildfire Guide

Target Audience: Managers of state, tribal and territory UST programs in Region 9.

Purpose: The EPA Underground Storage Tank (UST) / Above Ground storage Tank (AST) Wildfire Guide was developed by EPA to help owners/operators/program implementers prepare for, respond to, and recover from the catastrophic effects and environmental harm posed by wildfires to UST/AST facilities. This training will provide grantees information on the resources identified in the Guide.

Training Development & Delivery Team: EPA Region 9, Underground Storage Tanks Section, LCRD.

Timing: FY22

Measures: Number of attendees.

13. Climate Adaptation and Disaster Debris Planning for Tribes

Target Audience: Tribes in Region 9.

Purpose: To assist tribal communities in planning for how they will manage solid waste after a disaster hits.

Training Development & Delivery Team: EPA Region 9, Zero Waste Section, LCRD, and ORCR.

Timing: FY22

Measures: Number of attendees.

14. SDWA Section 1433 – Risk and Resiliency Assessments and Emergency Response Plans

Target Audience: Community water systems serving greater than 3300 persons.

Purpose: Assist community water systems to comply with SDWA Section 1433 which requires drinking water utilities serving greater than 3300 persons to conduct risk assessments and update their emergency response plans every five years.

Training Development & Delivery Team: EPA Region 9, EPA HQ OW, Technical Assistance providers (i.e., Rural Water Association, Rural Community Assistance Corporation).

Timing: FY22

Measures: Number of attendees.

15. After a Wildfire: Indoor Air Quality, Clean-Up, and Safe Return Training

Target Audience: Tribes impacted by wildfires.

Purpose: To increase technical ability and capacity for tribes to deal with the effects of wildfires, specifically environmental hazards that may prevent safely returning home, to support community resiliency and safety during wildfires.

Training Development & Delivery Team: EPA Region 9, Institute for Tribal Environmental Professionals.

Timing: FY22

Measures: Number of attendees.

5.2. Training Needs

EPA Region 9 notes that there is much interest in further training on climate impacts and climate adaptation. To encourage collaborative training development and delivery to meet these needs, EPA Region 9 is providing descriptions of proposed training here.

5.2.1. Training Needs for EPA Staff

16. Linking Risk-Based Emergency Response Communication Skills with Developing Community Involvement Plans that Consider Climate Impacts

Target Audience: EPA staff, including Community Involvement Coordinators and staff from Superfund and Emergency Management Division.

Description of Need: We need training that bridges the gap of EPA personnel's risk-based-emergency-response communication skills and developing Community Involvement Plans (CIPs) that address the increasing frequency of climate related emergencies. Bridging the gap will help Superfund adequately prepare its communities to respond to emergencies.

Background:

- HQ has offered risk-based communication trainings for EPA personnel to learn how to more effectively spread the knowledge of climate change risks.
- EPA's Superfund Division is incorporating climate change consideration into site management plans and associated CIPs.
- In order for Superfund to update site management plans (SMPs), Remedial Project Managers and their associated CICs need training on anticipated climate impacts and climate-related natural disasters, and how to incorporate consideration of impacts and climate adaptation actions into the documents (SMPs and CIPs). EPA staff, including CICs and RPMs, can also be trained on how to include resources for communities that will prepare for climate-related natural disasters.

Purpose: Improve EPA staff's ability to incorporate climate change into Community Involvement Plans and SMPs.

Proposed Training Development Team: TBD

Barriers to Developing or Holding the Training: Staff time to develop, administer and attend.

Timing: TBD

17. Understanding Social Science to Encourage Long-term Change that will Improve Communities' Success with Natural Disaster Mitigation and Climate Adaptation

Target Audience: EPA Community Involvement Coordinators in OPA and potentially SEMD staff.

Description of Need: Climate-driven natural disasters pose risks for communities, including those adjacent to Superfund sites. EPA's Community Involvement Coordinators (CICs) need to better understand current social science concepts that lead to successful long-term change and affect how government can influence the public's decision-making to prepare for emergencies beforehand; so that they can collaborate better with Superfund-adjacent communities to build resilience to natural disasters. EPA CICs can assist communities to plan ahead and be more resilient to future climate impacts, including impacts at nearby Superfund sites.

Background: Effective social science training for EPA CICs can focus on how to leverage the understanding of human decision making to better serve communities. Whether a particular behavior change campaign is successful or not can crucially depend not only on the message itself, but also on how it is communicated.

Communicating the need for change and the method for implementing that change in a manner consistent with cultural and social mores should lead to greater acceptance of the message and higher success of implementation. CICs can work with communities to identify how to best support actions and behaviors that build resilience to climate impacts and will ultimately result in reducing communities' exposure to Superfund site related contaminants. New approaches can be added to the existing CIC toolbox that focus on incentives, information, and signs supporting resilient actions. CICs can learn about the use of effective language and graphics.

Purpose: Improve EPA staff's ability to assist communities to build resilience to climate impacts, including impacts on nearby Superfund sites.

Proposed Training Development Team: TBD

Barriers to Developing or Holding the Training: Staff time to develop, administer and attend.

Timing: TBD

18. Understanding and Communicating about EPA's Climate Change Work

Target Audience: Staff at EPA Region 9 Office of Public Affairs and other interested EPA Region 9 Staff

Description of Need: EPA Staff can benefit from increasing their understanding of EPA's climate change work and building their skills in communicating this knowledge to communities and other EPA partners. This can begin with looking at how climate impacts EPA's ability to meet its mission to protect human health and the environment, and how Region 9 communities are subject to climate impacts. In addition, staff would benefit from learning how consideration of climate change is already a part of some EPA programs, and where it is being added. To finish up, staff can hone their skills on how to effectively communicate with communities, and other EPA partners about EPA's climate change-related work and climate impact risks in their part of Region 9.

Purpose: To Improve EPA staff knowledge of EPA's own climate change work; and improve EPA staff ability to communicate with communities about EPA's climate change work.

Proposed Training Development & Delivery Team: EPA Region 9 OPA, HQ Office of Policy, the Cross-EPA Climate Adaptation Workgroup, and EPA science/risk communication experts

Barriers to Developing or Holding the Training: Staff time and energy to develop and administer, as well as to attend

Timing: TBD

6. CLIMATE ADAPTATION SCIENCE NEEDS

6.1. Need for Research and Tools

US EPA's Office of Research and Development (ORD) is gathering information from EPA Regions and EPA National Program Offices on science needs related to climate adaptation. ORD would like to know what climate adaptation research and tools the rest of EPA would like them to pursue, develop, and update.

EPA Region 9's Laboratory Support and Applied Science Division and our EPA Region 9 ORD Science Liaison, Matt Small, asked EPA Region 9 to identify needs for climate adaptation research and tools. EPA Region 9 encourages ORD to take action on the needs listed below. Those interested in knowing more about specific items listed here may contact EPA Region 9.

Tribal, Intergovernmental and Policy Division

1. Update tools like EJ Screen and EnviroAtlas to make them more useful for evaluating EJ issues for Pacific Island and Tribal Nations, as well as for evaluating cumulative impacts and risks for all communities.
2. Develop a tool or method to access information on precipitation extremes including anticipated precipitation rates, and frequency and severity of both flooding and drought. This would be used for the environmental review of proposed federal projects, under NEPA. The scale should be flexible and allow

for matching the geographic area relevant to a given project proposed by a federal entity. Ideally information would be readily available to federal project proponents, as they consider projects and develop their NEPA documents before submitting their proposal to EPA.

3. Assist tribes in developing localized data sets for a range of climate impacts, in coordination with regional and state partners.

Office of Public Affairs

1. Determine how to best protect children and communities from effects of wildfire and extreme heat.

Air and Radiation Division

For climate adaptation for air quality impacts due to wildfires, EPA Region 9 needs methods and tools to:

1. improve methods for the evaluation of impacts, such as through sensor deployment and performance testing;
2. improve our recommendations for cleaning wildfire smoke out of indoor air, such as through the testing of DIY air cleaners; and
3. improve communication with communities on why and how to reduce wildfire smoke exposure.

Land Chemicals and Redevelopment Division

For climate adaptation for locations with hazardous waste, we need assistance to:

1. Enhance and supplement existing web map resources to evaluate climate change impacts on remedy resiliency at RCRA and TSCA PCB cleanup sites and permitted facilities, including:
 - a. Assist with identifying and inserting a database layer on groundwater table rise.
 - b. Assist with identifying and inserting a database layer on projections for the height of coastal storm surge.
 - c. Make recommendations for how best to visually depict the combined effects of projected sea-level rise, storm surge, wave runup, and groundwater table rise.
2. Determine how to best display projections for sea-level rise and storm impacts, looking at future year and storm event scenarios. Consider developing Climate Change Impact or Vulnerability Index for regions and sub-regions, states, cities, or sites/facilities.

Superfund and Emergency Management Division

1. Develop tools to evaluate areas most at risk of contamination impacts from climate change and adaptation options for managing risk.
2. Develop tools to help incorporate climate change resilience into remedy selection and protectiveness determinations for currently listed Superfund sites.

Water Division

1. Develop tools to help increase beneficial reuse of dredged material as a critical climate adaptation and resilience strategy.
2. Carry out research on temperature impacts on salmon in California to support EPA Region 9 guidance on salmonid temperature thresholds.
3. Develop tools for assessing coral reef ecosystem services and ecosystem health.
4. Develop better indicators of ocean acidification (consider aragonite saturation, pteropod development inhibition or shell dissolution, etc.).
5. Provide a model for the changes in the coastline in the next decade (as a start) and relative location of utilities and related linear infrastructure (e.g., drinking water and wastewater treatment plants, water supply sources including wells and aquifers, power plants, related pipes and pumps, access roads, power lines, communication lines, and security). The purpose is to address the current and near-term impact of large-scale sea-level rise on infrastructure. Rapid development of an accessible model is key if it is to be

used in a timely manner. This request includes all coastlines in Region 9 including the Pacific Islands and includes overburdened communities (communities facing EJ issues).

Mission Support Division

1. Make data sets with climate change impact information more readily available and accessible.

Cross-Division Needs

1. Develop research on cascading effects of climate impacts that cut across program lines, and associated climate adaptation actions. An example query is, “What are the relative impacts of wildfires and controlled burns on air quality and water quality, and would fuels management reduce impacts to both?”

6.2. Need for Usable Science Information

In addition to assistance with research and tools development, EPA Region 9 will need assistance locating climate-related science information that is accessible at multiple levels. Such information can be used by our partners to communicate with their public, members, staff, and others to build climate resilience. This could call for preparing multiple types of materials at different levels of complexity and delivering the materials through different modes. For example, on a given topic, EPA could provide an infographic, a fact sheet, and links to relevant research or findings. These can be provided through our website, on social media, and in print at an in-person meeting. All materials would ideally be produced in the primary languages of the community(ies) that EPA is working with. If EPA develops community-specific science information, it should be done with input from the community(ies) so that we respond to their questions effectively.

As an example, tribes and other EPA partners have requested information on anticipated climate impacts to their lands and waters. They want to have access to the most relevant data, provided in an accessible manner to use in their GAP-funded vulnerability assessments and climate adaptation plans. This could include information on already-observed changes or anticipated changes in rainfall, temperature, surface water, groundwater, and other parameters. Possible steps could include having a dialogue with the tribes about their specific information needs and working with experts inside and outside of EPA (along with the tribes) to identify if and how the tribes’ needs can be met, and then delivering the information, in collaboration with other agencies where possible and appropriate.

7. CONCLUSION

Climate change is impacting human health and the environment. While EPA works to reduce climate change through climate mitigation actions, we and our partners can also work to build resilience through climate adaptation actions.

This EPA Region 9 Climate Adaptation Implementation Plan describes 39 climate adaptation actions, a training plan, and science needs. Actions address how EPA can incorporate climate adaptation into our programs to optimize their effectiveness in the presence of climate impacts, and how EPA works with our partners to help them build resilience to climate impacts. Many actions include collaboration with other federal departments and agencies.

Some communities are more at risk from climate impacts given their location, long standing environmental concerns, and lack of resources. EPA will persist in finding opportunities to work with communities to build climate resilience, including communities facing environmental justice concerns.

EPA Region 9 will continue to implement the described actions, many in collaboration with partners. We will update the CAIP regularly to keep pace with new information on climate impacts, new internal and external priorities, and new opportunities for effective climate adaptation action. EPA Region 9 welcomes suggestions on

how this CAIP and our approach to climate adaptation can be improved, and how we can best work with EPA partners to build resilience to climate impacts. Our actions now make it more possible to meet our mission to protect human health and the environment today and in the future.

APPENDICES

A. GLOSSARY OF ACRONYMS

Acronyms for US EPA Region 9 Divisions and Offices

ARD - Air and Radiation Division

ECAD - Enforcement and Compliance Division

LCRD - Land, Chemicals and Redevelopment Division

LSASD - Laboratory Support and Applied Science Division

MSD - Mission Support Division

ORC - Office of Regional Counsel

PAO - Public Affairs Office

PIO - Pacific Islands Office

SEMD - Superfund and Emergency Management Division

TIPD - Tribal, Intergovernmental and Policy Division

WD - Water Division

Other Acronyms

ADEQ - Arizona Department of Environmental Quality

AR - Aquifer Recharge

ARNI - Aquatic Resource of National Importance

ARP – American Rescue Plan

ASR - Aquifer Storage and Recovery

AST - Above Ground Storage Tanks

AWIA - America's Water Infrastructure Act

BCDC - San Francisco Bay Conservation and Development Commission

BECQ - The Commonwealth of the Northern Mariana Islands Bureau of Environmental and Coastal Quality

BIL - Bipartisan Infrastructure Law

CalEPA - California Environmental Protection Agency

CAL FIRE - California Department of Forestry and Fire Protection

CARB - California Air Resources Board

CDFW - California Department of Fish and Wildlife

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)

CFR - Code of Federal Regulation

CIPs - Community Involvement Plans

CNMI - The Commonwealth of the Northern Mariana Islands

COVID-19 - Coronavirus Disease 2019

CWA - Clean Water Act

CWSRF - Clean Water State Revolving Fund

DMMT - Dredged Material management Team (Southern California)

DWSRF - Drinking Water State Revolving Fund

EJ - Environmental Justice

EPA - US Environmental Protection Agency

EPM - Environmental Programs and Management (funding)

ERP - Emergency Response Plan

FEMA - Federal Emergency Management Agency

FAS – U.S Freely Associated States of Micronesia

FTE - Full-Time Equivalent units for staffing

GAP - Indian Environmental General Assistance Program

GWPC - Ground Water Protection Council

HQ - EPA National Offices in Washington, D.C.

HAB - Harmful Algal Bloom

HUD - US Department of Housing and Urban Development

HVAC - Heating, Ventilation, and Air Conditioning

I & I - Infiltration and Inflow

IAC - Incident Action Checklist

LEP - Limited English Proficient

LTMS - Long-Term Management Strategy (San Francisco Bay)

LUST - Leaking Underground Storage Tanks

mcy - million cubic yards

MAR - Managed Aquifer Recharge

MERV - Minimum Efficiency Reporting Value

MOA - Memorandum of Agreement

MPRSA - Marine Protection, Research, and Sanctuaries Act

NADB - North American Development Bank

NCP - National Contingency Plan

NEPA - National Environmental Policy Act

NGO - Non-governmental Organization

NMFS - National Marine Fisheries Service

NOAA - National Oceanic and Atmospheric Administration

NPL - National Priorities List for Superfund

OAQPS - US EPA Office of Air Quality Planning and Standards

OAR - US EPA Office of Air and Radiation

OCHP - US EPA Office of Children's Health Protection

OECA - Office of Enforcement and Compliance

OLEM - US EPA Office of Land and Emergency Management

OP - US EPA Office of Policy

ORCR - US EPA Office of Resource Conservation and Recovery

ORIA - US EPA Office of Radiation and Indoor Air

ORISE - Oak Ridge Institute for Science and Education (Fellowship)

OSCs - On-Scene Coordinators

OW - US EPA Office of Water

PCB - Polychlorinated biphenyl

RA - Risk Assessment

RCRA - Resource Conservation and Recovery Act

SSO - Sanitary Sewer Overflow

PRP - Potentially Responsible Parties

PWS - Public Water System

RCAC - Rural Community Assistance Corporation

RTOC - Regional Tribal Operations Committee

RFA - Request for Applications

SDWA - Safe Drinking Water Act

SFEI - San Francisco Estuary Institute

SMPS - Sight Management Plans

SRF - State Revolving Fund

TSCA - Toxic Substance Control Act

UIC - Underground Injection Control

US - United States

USACE - US Army Corps of Engineers

USDA - US Department of Agriculture

USDA-RD - USDA Rural Development

USFWS - US Fish and Wildlife Service

USGS - US Geological Survey

UST - Underground Storage Tanks

WPDG - Wetland Program Development Grant

WSPEHSU - Western States Pediatric Environmental Health Specialty Unit

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