

Memorandum

Subject: One Water Approach for the North Bay

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To: Judy Kelly, Executive Director, North Bay Watershed Association (NBWA)

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1. Introduction

Water managers and decision-makers around the world are working to meet the challenges of seasonal and inter-annual water scarcity, extreme weather events and flooding, and impacted water quality and aquatic habitats. Climate change threatens to further complicate or exacerbate these challenges/effects. “One Water” is an integrated water management approach that seeks to address these and other fundamental challenges through increased regional and inter-agency coordination and an expanded understanding of water resources through the complete hydrological cycle.

Closely related to integrated water resources management (IWRM) and water-sensitive urban design, One Water seeks to move away from conventional, or historic problem solving approaches that generally focused on one issue at a time, and now work towards a greater coordination among diverse interests, stakeholders, and decision-makers. One Water recognizes that water quantity and quality, both above and below ground, depend on multi-faceted collaborations (Mukheibir et al. 2014).

One Water also appreciates that the water cycle is an integrated and interconnected system, such that one aspect of the system cannot be disconnected from others. As described by the American Planning Association (APA) in its July 2016 Water Policy Guide (APA 2016): “an urban water cycle [is] a single, integrated system, in which all urban water flows are recognized as potential resources, and the interconnectedness of water supply, groundwater, stormwater and wastewater is optimized, and their combined impact on flooding, water quality, wetlands, watercourses, estuaries and coastal waters is recognized.”

Improving coordination among diverse stakeholders and understanding the inherent interconnectedness of different aspects of water resources management can allow water managers and agencies to avoid “siloeing,” where individual departments do not effectively communicate with each other. Viewing water as one resource also urges planners to employ sustainable practices that will safeguard our future, as well as value resources that may have historically been considered “waste” or not valuable from a water resources management perspective. For example, wastewater discharged to a river from one facility may become part of the water supply for downstream drinking water utilities, while wetlands can be understood to not only provide aquatic habitat, but also flood management and water quality benefits.

Overall, a One Water approach can provide a number of benefits, including more resilient potable and non-potable water supplies, better management of wastewater and stormwater, stronger ecosystems, and better quality of life for all citizens (APA 2016).

2. One Water Examples from Other Bay Area Agencies

Several other Bay Area agencies have already developed a One Water plan or otherwise implemented a One Water approach. Two such example agencies are discussed below to provide context and insight into the possible One Water approach that could be taken by NBWA and its member agencies.

2.1. San Francisco Public Utilities Commission (SFPUC)

The SFPUC has been working under the One Water concept for several years and considers the approach now as “how they do business.” With a host of operational changes to how the city thinks about and develops projects, the SFPUC has become another leader in the way water resources are managed. The OneWaterSF Plan’s guiding principles are as follows (SFPUC 2016):

1. Match the right resource to the right use.
2. Look holistically at our water, wastewater, and power systems to develop programs, policies, and projects that provide multiple benefits.
3. Plan for variable outcomes and build in flexibility to adapt to future changes.
4. Develop projects and programs that conserve resources and promote ecosystem health, including the health and quality of our watersheds, the San Francisco Bay, and the Pacific Ocean.
5. Work across traditional boundaries within our organization to foster collaboration that results in the efficient use of our water, wastewater, energy, and financial resources.
6. Engage our communities to foster awareness and collaboration around OneWaterSF.
7. Pursue partnerships with other agencies, the private sector, and other stakeholders to generate new and creative ideas.
8. Pilot state-of-the-art technologies, and test new approaches to develop new business practices.

Following these principles, the SFPUC has implemented a range of projects that reuse “wastes” and value water resources at different stages of the water cycle. For example, the City is reusing water in buildings through its Non-potable Water Program, and capturing and reusing stormwater through its Urban Watershed Management Program, among other activities/initiatives.

2.2. Valley Water (formerly Santa Clara Valley Water District)

Valley Water’s One Water Plan envisions a plan that will “Manage Santa Clara County water resources holistically and sustainably to benefit people and the environment in a way that is informed by community values.” The Plan integrates the water supply, flood protection, and stream stewardship missions of Valley Water at the watershed scale. It will draw from

detailed existing programs and plans intending to find the nexus between these three mission components for new opportunities in integrated water resources management. Valley Water makes clear that One Water does not replace the substantial existing planning in place by its Water Utility Enterprise and the Watersheds Division, but instead looks for opportunities to further protect and enhance water resources.

Valley Water's tiered One Water Plan begins with a countywide framework (Tier I) to establish guidance for watershed-specific plans. Then, each of the five major watersheds in Santa Clara County (Coyote, Guadalupe, West Valley, Lower Peninsula and Uvas/Llagas) will have their own master plan (Tier II) to guide future decisions on programs and projects to protect or enhance the community and environment. These plans will also provide a basis for partnerships with other agencies, funding initiatives, grant opportunities, and new policy recommendations and are meant to lead to more integrated water planning, sustainable watershed habitat, better relationships with public and regulatory agencies, improved living environment for humans and wildlife.

Valley Water expects that it will take up to four years to complete the plans for all five watersheds, following completion of the countywide framework. The first watershed-specific plan will be Coyote Watershed, followed by Guadalupe and West Valley, and then Lower Peninsula and Uvas-Llagas watersheds. Valley Water expects that implementation of these plans will lead to new projects, programs, policies and partnerships.

Figure 1 shows Valley Water's One Water historical conceptual model, which shows the interrelationships between surface water, groundwater, and different habitat types in the San Francisco Bay and surrounding uplands.

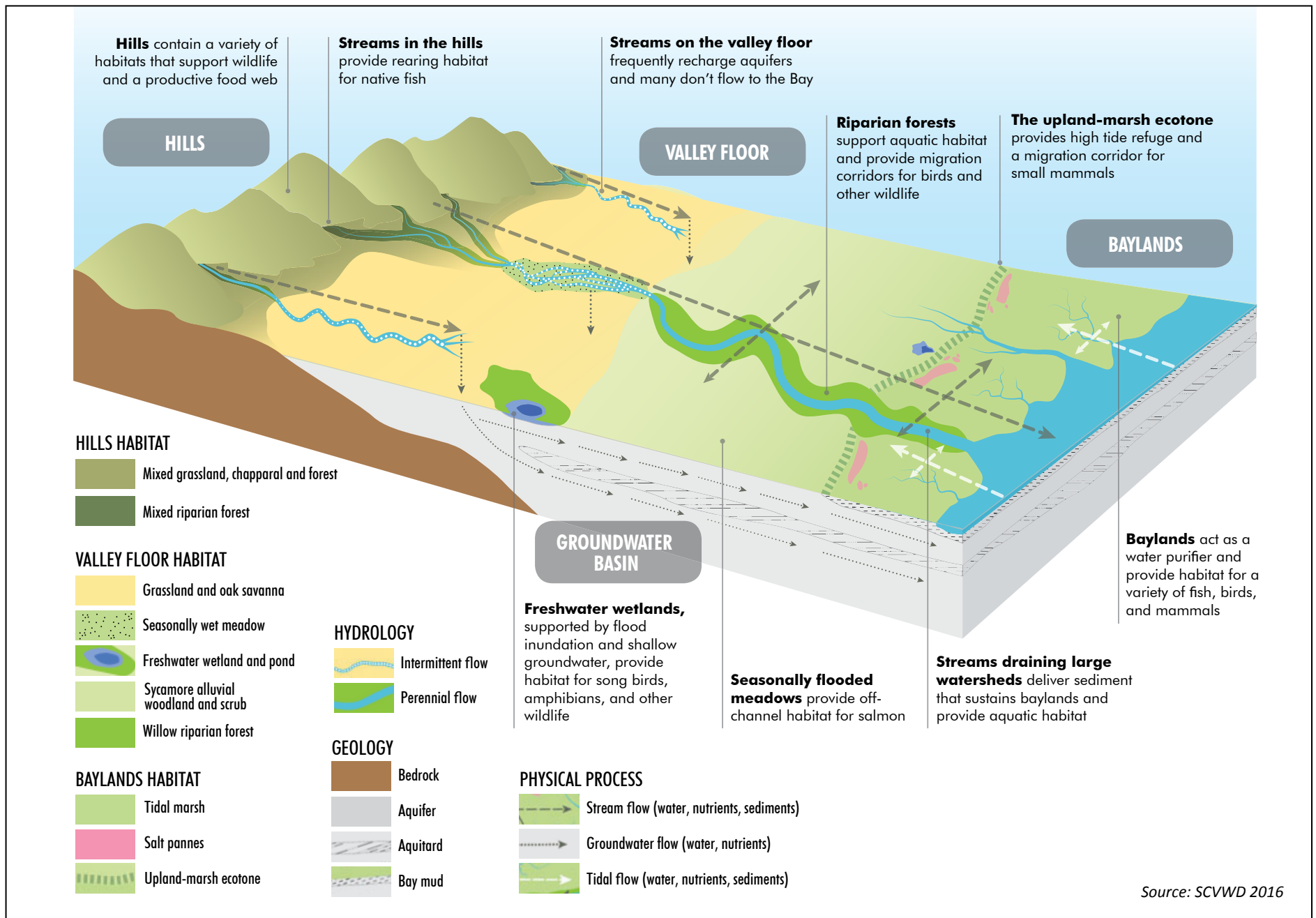


Figure 1. Valley Water's One Water Historical Conceptual Model

3. Current Status of North Bay Watershed and Water Resources Management Issues

3.1. Sustainable Water Supply

NBWA member agencies obtain water from a number of different sources, including local runoff, imported water from neighboring watersheds or large state facilities (i.e., State Water Project), recycled water, and groundwater. Other sources (e.g., desalinated water) are also under consideration. Sonoma Water is one of the largest water suppliers in the region and provides wholesale water to several cities and unincorporated areas within the North Bay area. Sonoma Water's supplies come principally from the Russian River and Dry Creek watersheds, as well as imported water from the Eel River Watershed (i.e., through the Potter Valley Project). Water from Sonoma sources is transported to NBWA agencies through several aqueducts (e.g., Sonoma Aqueduct, North Marin Aqueduct).

Sonoma Water, as well as most other NBWA member agencies, have investigated various alternative water sources, implemented effective water conservation programs, and considered ways to improve the sustainability of their water supplies. Marin Municipal Water District (MMWD) has implemented a host of water conservation programs, such as a Laundry-to-Landscape greywater system rebate program and water-wise gardening guidance.

One Water opportunities related to sustainable water supply include any number of recycled water/water re-use projects, especially those implemented on a regional scale (see North Bay Water Reuse Program discussed in the following section), as well as continued conservation efforts. Increased inter-agency, regional coordination around alternative sources (e.g., rainwater, stormwater, seawater, etc.) is also possible.

3.2. Sustainable Ground Water

Sustainable groundwater management is now required by law in California through the Sustainable Groundwater Management Act (SGMA). Under SGMA, groundwater sustainability agencies (GSAs) must be formed for high and medium priority groundwater basins (as identified under the California Statewide Groundwater Elevation Monitoring System [CASGEM]) by 2017. Groundwater sustainability plans (GSPs) must be developed by 2020 for critically overdrafted basins, or by 2022 for all other high and medium priority basins.

The NBWA area includes three groundwater basins subject to SGMA: the Petaluma Valley Groundwater Basin (medium priority; overseen by Petaluma Valley GSA); the Napa-Sonoma Valley Groundwater Basin, Sonoma Valley Subbasin (high priority; overseen by Napa-Sonoma Valley GSA), and the Napa-Sonoma Valley Groundwater Basin, Napa Valley Subbasin (high priority; no GSA) (California Department of Water Resources [DWR] 2019a, 2019b). GSPs are still in development for these basins (with the exception of Napa Valley Subbasin; see further discussion below).

Beyond SGMA, many NBWA member agencies have taken actions and considered strategies to improve groundwater sustainability. For example, Sonoma Water, in concert with City of Sonoma and other local partners, conducted a Groundwater Banking Feasibility Study to investigate the potential for a regional groundwater banking program, which would involve diversion and transmission of surplus Russian River water produced during wet weather conditions for storage in aquifers beneath the Santa Rosa Plan and/or Sonoma Valley (Sonoma Water 2019). Sonoma Water has also conducted stormwater management-

groundwater recharge studies in the Laguna-Mark West, Sonoma Valley, and Upper Petaluma Watersheds. MMWD is investigating expanding groundwater storage in the Lagunitas Watershed and Ross Valley to improve its resiliency to potential water supply shortages (MMWD 2017). Napa County, in lieu of forming a GSA and developing a GSP for the Napa Valley Subbasin, prepared a Basin Analysis Report that demonstrates that the basin has operated within its sustainable yield over a period of at least 10 years (Napa County 2016).

One Water opportunities include continued and expanded inter-agency, regional coordination on groundwater recharge and storage projects. Additionally, through a One Water framework, multiple benefits of projects may be better recognized and valued (e.g., increasing flow in surface streams could provide groundwater recharge and improved habitat).

3.3. Flood Management

Flood management is generally provided in the NBWA area through maintenance of streams and creeks by County agencies and/or flood control districts. There are no major dams/reservoirs within the NBWA area that are managed solely for flood protection, although levees also provide flood protection for some of the low-lying areas. Surface runoff within the region is transported ultimately to the San Pablo Bay/San Francisco Bay or to the Pacific Ocean via the Russian River and other local coastal streams. The North Bay area is often subject to flooding during the wet winter months (e.g., Highway 37, which provides service between Vallejo and Novato, has been repeatedly and increasingly flooded in recent years), and this flooding is expected to become worse in the future with estimated sea level rise and future winter storms of increased frequency and intensity (atmospheric rivers, etc.).

Efforts to address flooding issues by NBWA member agencies include climate change adaptation studies (discussed further below), improved radar and forecasting technology (e.g., Advanced Quantitative Precipitation Information system), timely and effective stream maintenance activities (e.g., vegetation management, sediment removal), watershed restoration projects, and municipal stormwater management programs. The Napa River and Creek Flood Project, implemented by Napa County and the USACE, will restore more than 900 acres of tidal wetlands of the San Francisco Bay Estuary while protecting 2,700 homes, 350 businesses, and over 50 public properties from 100-year flood levels (Napa County 2019). Further upstream along the Napa River, Napa County has worked closely with many private landowners to restore the Napa River in the Rutherford and Oakville reaches, primarily through providing the river greater width and



The Napa River oxbow is an example of an innovative flood management approach in the North Bay. (Photo credit: California WaterBlog)

more floodplain interaction. This approach has been groundbreaking in its ability for several private landowners to work together with the County to provide flood protection while also providing ecologic enhancement and restoration.

One Water opportunities include continued and expanded inter-agency, regional coordination to develop multi-benefit projects (e.g., wetland restoration) and the use of technology to improve flood forecasting and response.

3.4. Water Quality

Numerous federal and state laws and regulations govern water quality in California. The federal Clean Water Act (CWA) and state Porter-Cologne Water Quality Control Act (Porter-Cologne Act) require designation of beneficial uses for surface waters and protection of water quality to support those beneficial uses. Section 303(d) of the CWA provides a mechanism for identifying impaired surface water bodies and correction of those impairments through implementation of Total Maximum Daily Loads (TMDLs). The California Regional Water Quality Control Boards (RWQCBs), pursuant to the CWA and Porter-Cologne Act, also regulate point-source discharges of waste (e.g., wastewater treatment plant outfalls) and non-point-source discharges (e.g., stormwater runoff). Public water suppliers also must comply with the Safe Drinking Water Act (SDWA) to ensure public drinking water supplies meet water quality standards.

NBWA member agencies must comply with the existing federal and state laws for water quality. Many NBWA agencies operate wastewater treatment facilities and/or provide sewer service and their discharges must comply with water quality standards. Likewise, numerous NBWA agencies are public water suppliers and must ensure that their water supplies meet standards under the SDWA. A number of water bodies/water body segments in the NBWA area are listed as impaired under CWA Section 303(d), such as the following (State Water Resources Control Board [SWRCB] 2017):

- Napa River, Mare Island Strait (chlordane, dieldrin, mercury, polychlorinated biphenyls [PCBs]);
- Napa River, non-tidal (nutrients, pathogens, sedimentation/siltation);
- Napa River, tidal (nutrients, pathogens);
- Petaluma River (diazinon, nutrients, pathogens, sedimentation/siltation, trash);
- Petaluma River, tidal portion (diazinon, nickel, nutrients, pathogens);
- Richardson Bay (chlordane, dichlorodiphenyltrichloroethane [DDT], dieldrin, dioxin compounds, furan compounds, indicator bacteria, invasive species, mercury, PCBs);
- San Francisco Bay, Central (chlordane, DDT, dieldrin, dioxin compounds, furan compounds, invasive species, mercury, PCBs, selenium, trash);
- San Pablo Bay (chlordane, DDT, dieldrin, dioxin compounds, furan compounds, invasive species, PCBs, selenium);
- Sonoma Creek, non-tidal (nutrients, pathogens, sedimentation/siltation), and
- Sonoma Creek, tidal (nutrients, pathogens).

TMDLs are in effect for all of these water bodies/pollutants, which NBWA member agencies may be subject to. Groundwater quality will be addressed through SGMA, and several

agencies also are implementing salt and nutrient management plans to minimize impacts of watershed activities to groundwater quality.

One Water opportunities related to water quality include improved regional coordination among agencies to achieve TMDLs and implement projects that improve water quality while also providing other benefits (e.g., wetland/habitat restoration, improved stormwater capture and treatment, green stormwater infrastructure, etc.).

3.5. *Protecting and Enhancing Aquatic Habitats*

A number of habitat restoration projects have recently been implemented or are on-going in the North Bay Area. These types of projects are often undertaken by non-governmental organizations (NGOs), but may also be undertaken by public agencies, including NBWA member agencies. For example, Save the Bay has been leading a wetland restoration project in the Bel Marin Keys area of Novato, which is part of the larger Hamilton Wetlands Restoration Project funded by the California State Coastal Conservancy (Save the Bay 2019). Point Blue Conservation Science has also been heading tidal march restoration efforts at the Sonoma Baylands site at Sears Point (Camhi 2018). While not specifically designed to restore habitats, many other activities of NBWA member agencies (e.g., stream maintenance programs) are implemented so as to protect and enhance aquatic habitats to the extent possible.

In general, the North Bay is one of the less populated areas of the San Francisco Bay Area and is home to some of the Bay Area's largest remaining tracts of wetlands. As indicated in the "Water Quality" section above, however, many aquatic habitats are significantly impacted from pollutants. Many of the streams (e.g., Sonoma Creek, Petaluma River, and Napa River) in the NBWA area are considered critical habitat for steelhead, which is listed as threatened under the federal and state Endangered Species Acts (U.S. Fish and Wildlife Service [USFWS] 2019). Other special-status species potentially found in NBWA water bodies and suitable habitat include delta smelt, longfin smelt, Central California Coast Coho salmon, tidewater goby, California freshwater shrimp, California tiger salamander, California red-legged frog, foothill yellow-legged frog, western pond turtle, California clapper rail, marbled murrelet, western snowy plover, and the salt marsh harvest mouse.

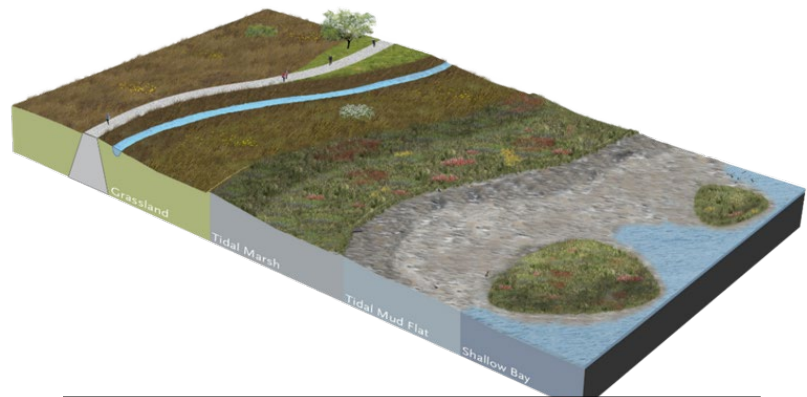
One Water opportunities in this sphere include any number of habitat restoration projects, which, by their nature, often tend to provide multiple benefits. Habitat protection and enhancement also is often more effective on a larger scale; therefore, a regional, integrated One Water approach could be helpful in this regard.

3.6. *Climate Change and Sea Level Rise*

It is widely accepted in the scientific community that climate change is occurring and that human activities are playing a role in the observed changes. As reported by the International Panel on Climate Change (IPCC), the globally averaged combined land and ocean surface temperature data as calculated by a linear trend show a warming of 0.85 degrees Celsius over the period 1880 to 2012 (IPCC 2014). They further find that it is *extremely likely* that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by anthropogenic increase in greenhouse gas (GHG) concentrations and other anthropogenic forcings together (IPCC 2014). Most climate models predict that substantially more warming will occur in the future, along with increased frequency and intensity of storms, sea level rise, and other effects.

In the NBWA area, climate change could potentially lead to heightened flood risk, while sea level rise could impact shore-line properties and habitats. Climate change could also affect water supply reliability. Efforts underway to study and address climate change and sea level rise by NBWA member agencies include Marin County's Collaboration: Sea-Level Marin Adaptation Response Team (C-SMART) and Marin Bay Waterfront Adaptation Vulnerability Evaluation (BayWAVE) projects, which look at coastal and bayside vulnerability and adaptation to sea-level rise, respectively. Sonoma Water is planning for potential impacts of climate change on water supply and flood control as part of its Water Supply Strategies Action Plan.

One Water opportunities include greater regional coordination with respect to climate change and sea level rise adaptation strategies and development/implementation of integrated water resource projects. Although not within the NBWA, the Oro Loma Sanitary District implemented an innovative "Horizontal Levee" project that demonstrates One Water principles in addressing sea level rise. Instead of a vertical wall to protect against storm surges, a horizontal levee uses vegetation on a slope to break waves (Oro Loma Sanitary District 2019). Meanwhile, the ecosystems that live on horizontal levees can thrive while helping to further process wastewater from treatment plants (Oro Loma Sanitary District 2019).



Three-dimensional, conceptual representation of the Oro Loma Sanitary District Horizontal Levee project design. (Photo credit: The Bay Institute)

4. North Bay Projects that Demonstrate One Water Approach

As alluded to in the previous section, many NBWA agencies are already implementing projects that address different watershed and water resources management issues, and which would fit well under a One Water approach. Several projects, in particular, are worthy of a more detailed discussion, as they illustrate key tenets of One Water or are indicative of the types of opportunities for multi-objective projects that could be facilitated through a One Water framework.

4.1. **Example 1: Groundwater Banking in Sonoma County**

A good example of integrated, regional, multi-objective planning that has already been occurring between and among NBWA agencies is the groundwater banking effort in Sonoma County. Sonoma Water, in partnership with the Cities of Cotati, Rohnert Park and Sonoma, Valley of the Moon Water District, and the Town of Windsor conducted a feasibility study for a regional groundwater banking program in 2013 (Sonoma County Water Agency [SCWA] 2013). As described in the feasibility study, the groundwater banking program would involve diversion and transmission of surplus Russian River water produced at existing drinking water production facilities during wet weather conditions (i.e., the winter

and spring seasons) for storage in aquifers beneath the Santa Rosa Plain and/or Sonoma Valley (SCWA 2013). The stored water would then be available for subsequent recovery and use during dry weather conditions (i.e., the summer and fall seasons) or emergency situations. The feasibility study identified region-wide opportunities and constraints for groundwater banking and identified 14 total potential groundwater banking alternatives in the Santa Rosa Plain and Sonoma Valley Groundwater Basins.

Subsequent to the feasibility study, Aquifer Storage and Recovery (ASR) pilot projects have been developed, including in the City of Sonoma, to further assess the technical feasibility of the groundwater banking approach. This project demonstrates the type of regional projects that are possible when neighboring agencies work together, as well as the potential for projects to accomplish multiple objectives. In addition to providing enhanced reliability of the regional water supply during droughts or during periods of peak seasonal water demands, Sonoma Water notes that the groundwater banking program can help improve habitat conditions by enhancing tributary base flows and thus improving flow conditions for listed salmonids (SCWA 2013).



4.2. **Example 2: BayWAVE**

The BayWAVE study area covers the eastern Marin shoreline from the Golden Gate Bridge to the northern end of Novato, including several NBWA member agencies (e.g., City of Novato and City of San Rafael). The BayWAVE project is a focused vulnerability assessment that will evaluate the extent of impacted assets and work with local cities and towns to plan implementation of adaptation strategies. Thus far, the Project has completed a Marin Shoreline Sea Level Rise Vulnerability Assessment (County of Marin 2017), which describes sea level rise scenarios for Marin County and identifies near-term, medium-term, and long-term vulnerable assets along the Marin shoreline based on the sea level rise projections. These scenarios show that numerous critical infrastructure (e.g., roads, transit facilities, medical facilities, schools, etc.) are potentially vulnerable to sea level rise in the near- and longer-term. The report does not provide solutions and Marin County notes that “there are few easy solutions and most require additional input from the public and private landowners, resource agencies, through new and existing partnerships, and with additional funding.” The County envisions the next step as beginning to work with willing partners and communities to plan for sea level rise adaptation.



King tides in Mill Valley provide a glimpse of what sea level rise might look like in the future. (Photo credit: County of Marin)

By its nature, sea level rise is a regional issue, as it will affect whole stretches of coastline or shoreline. As such, it will require substantial coordination and cooperation across agencies and jurisdictions. It is also an issue that provides opportunities for multi-objective projects. One possibility for adaptation to sea level rise is restoring wetlands on the edges of the Bay (coupled with managed retreat in some locations as well as “harder” solutions, such as seawalls); in addition to flood attenuation, these types of projects could also provide habitat enhancement and water quality benefits. Going forward, BayWAVE is precisely the type of project that exemplifies and benefits from a One Water approach.

4.3. Example 3: North Bay Water Reuse Program (NBWRP)

The NBWRP is a regional water recycling and management initiative covering 315 square-miles in the portions of Marin, Sonoma and Napa counties that surround the northern rim of the San Francisco Bay (i.e., a very similar area to the NBWA area). The NBWRP is being developed by the North Bay Water Reuse Authority (NBWRA), which is composed of the following 10 agencies in the North San Pablo Bay region (all of which are also member agencies of NBWA):

- Las Gallinas Valley Sanitary District
- Napa County
- Napa Sanitation District
- Novato Sanitary District
- Sonoma Water
- Sonoma Valley County Sanitation District
- Marin Municipal Water District
- City of American Canyon
- City of Petaluma
- County of Marin

The NBWRP is intended to address water supply shortages from a watershed perspective by investing in diverse projects that offset potable demand throughout the region. Since its inception in 2002, the NBWRP has used a multi-benefit approach (i.e., considering urban, agricultural, and environmental needs) to recycled water supply planning and has applied

this from both the watershed and sub-regional perspective (NBWRA 2018).

The NBWRP is being developed in two phases, the first of which is currently under construction and the second of which is in the planning phase. Phase 1 includes a variety of recycled water treatment, distribution, and storage infrastructure across the NBWRP area. Phase 2 would continue the construction of new and improved recycled water infrastructure to allow for production and delivery of recycled water to customers in the North Bay. Phase 2 of the NBWRP would also include several wetland restoration and ASR projects. All told, when fully implemented, the NBWRP will provide 30,000 acre-feet per year of recycled water, thereby maximizing regional-scale recycling and water management opportunities to build long-term resiliency into the region's water supply (NBWRA 2018).



Purple pipe being installed for the North Bay Water Reuse Program. (Photo Credit: North Bay Water Reuse Authority)

The NBWRP is a good example of One Water thinking in action, as it involves regional and inter-agency coordination and planning, and values water in different phases of the hydrologic cycle/urban use cycle. Historically, treated wastewater may have been considered a “waste product,” but it increasingly makes sense to recycle this treated water for reuse applications. Water recycling projects are often implemented on a smaller-scale (e.g., within the confines of one jurisdiction); however, it is rare that such projects/programs are developed on a regional scale. In accordance with One Water principles, planning on this regional scale could potentially allow for economies of scale and/or a greater potential for achieving multiple benefits.

5. NBWA's Role in One Water Approach

As indicated above, one of the keys of One Water is regional, integrated planning and effective coordination across agencies. NBWA is already established as an organization of diverse regional and local public agencies throughout the North Bay region working to craft regional approaches to managing the common North Bay Watershed. NBWA members work cooperatively on water resources issues and go beyond traditional boundaries to promote good stewardship of the North Bay watershed(s). As such, NBWA is already functioning to support one aspect of a One Water approach, although this may not yet be formalized in a planning document.

In its regular Board Meetings, NBWA provides a forum for communication, dialogue, and ideas sharing across the various agencies that make up NBWA. Likewise, as shown in the example projects described above, many NBWA member agencies are already working together on multi-benefit and regional projects that exemplify One Water principles.

Although some regional, inter-agency coordination is already occurring and multi-benefit projects are being developed, a formalized One Water approach could improve efficiency and allow for the identification of additional opportunities. One of the challenges for the North Bay is that it has few combined districts, with four counties and numerous water agencies, each managing a portion of the overall system. In other words, many players in the North Bay water resources management sphere function in different roles. **Table 1** shows NBWA member agencies and the respective services they provide.

Table 1. North Bay Watershed Association Member Agency Services / Water Resource Management Areas

Agency	Water Supply	Flood Protection	WW Collection / Treatment	Stormwater Management	Recycled Water	Habitat Restoration
Bel Marin Keys Community Services District		x				
Central Marin Sanitation Agency			x			
City of American Canyon	x		x	x	x	
City of Novato				x		
City of Petaluma	x		x	x	x	
City of San Rafael			x	x		
City of Sonoma	x			x		
County of Marin		x				x
County of Sonoma						x
Las Gallinas Valley Sanitation District			x		x	
Marin County Stormwater Pollution Prevention Program				x		
Marin Municipal Water District	x				x	x
Napa Sanitation District			x		x	
North Marin Water District	x				x	
Novato Sanitary District			x		x	
Ross Valley Sanitary District			x			
Sonoma Water	x	x		x		
Sonoma Valley County Sanitation District			x		x	
City of Mill Valley			x			
Sewerage Agency of Southern Marin			x			
The Bay Institute						x
Tomaes Bay Watershed Council						

Development of a One Water plan and a formalized process for facilitating cross-communication between NBWA member agencies could benefit the region and potentially lead to more effective and wide-reaching multi-benefit projects. Such a plan/process could also allow for NBWA to function as a tracking and progress monitoring entity for projects in the North Bay area.

6. Conclusions and Next Steps

Given the numerous water resources challenges facing the North Bay and the world in light of climate change, resource scarcity and other factors, a One Water approach should be investigated for possible collaborations on projects and water resource management. This memorandum shows that many NBWA agencies are already working collaboratively with

other agencies in the region to address the myriad challenges. Many agencies are also already considering water resources opportunities throughout the full hydrologic cycle/urban use cycle. However, a formalized One Water plan/process is lacking for the region and could improve ongoing efforts.

The process of identifying One Water opportunities on a scale as large as the North Bay, while providing enough detail to encourage development of specific projects, will be challenging. As a start to this effort, the NBWA Joint Technical Committee will use their meetings and discussions over the remainder of 2019 to scope out the needs and opportunities of the NBWA members and local partners. This memorandum is the start of such discussions at the NBWA Board Level.

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