

Land of the West Wind

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# Winter Snowpack and Projections Towards 2050

### A low- to- no snow future and its effects on water resources in the western United States

Climate change is decreasing seasonal snowpacks globally with potentially catastrophic consequences on water resources, because we are reliant on snowpack for our water management. Across the western United States (WUS), snow water declines of ~25% are expected by 2050. There is less consensus on the timeline of snow disappearance, but model projections combined with a new low- to- no snow definition suggest that it will become persistent in ~35-60 years if greenhouse gas emissions continue unabated.

Diminished, short-lived snowpacks that melt earlier will alter groundwater and streamflow dynamics. Additional factors include higher evapotranspiration, altered vegetation composition, and changes in wildfire behavior. These changes will undermine conventional WUS water management practices, but there is potential to build resilience to persistent low- to- no snow conditions with adaptation strategies. Effective federal investments will require a concerted portfolio of activities that cross historical physical and disciplinary boundaries.



Water agencies will need to apply new approaches and develop non-traditional relationships for operations. A more holistic approach that considers change in the natural and managed systems can help to ensure that we are less vulnerable to both long-term change and short-term extremes. A community-wide effort is needed to support funding, legal and research institutions and incentives to represent diverse stakeholder needs. The overall goal would be WUS resilience to an imminent low- to- no snow future.

### **Recent Snowfall and Outlook for 2022 Drought Relief**

Record December snowfall has improved reservoir levels raising snowpack levels from 15% to 159% of normal in the Northern Sierras. However, in order to recover from the deficit after several dry years, more snow and rain will be needed through the spring (a measure of current snowpack is available from the Central Sierra Snow Lab at UC Berkeley at https://cssl.berkeley.edu/). Snowpack typically peaks in March, but after January's near-record dry conditions and increasing likelihood of continuation through mid-February, it's time to make preparations for a third dry year in 2022 in Suisun Marsh.

#### Land of the West Wind

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SRCD's public meetings are held at 2 PM on the second Wednesday of each month at the Solano County Supervisors Chambers 675 Texas Street Fairfield, CA 94533

SRCD represents private landowners of the Suisun Marsh at the Federal, State, and local levels. Its historic goal has been to achieve a water supply of adequate quality so that preferred wetland habitat values will be retained through appropriate management practices Through cooperation with landowners and various agencies, SRCD seeks to develop new programs aimed at protecting and improving the Suisun Marsh for future generations.

### **Change in Diversion Reporting Dates!**

The State Water Resources Control Board is changing the due dates for diversion reporting to align with the water year (1 October– 30 September). All Diverters must report their water use in this transition year by April 1, 2022 regardless of right or claim. If your previous reporting deadline was in July, **you MUST report by April 1, 2022 for only January to September 2021 in this transition. Thereafter, the annual reporting deadline will be February 1st for the previous full water year (October-September).** For example, February 1, 2023 will be the reporting date for 1 October 2021 to 30 September 2022.

#### How do I report my January 1—September 30, 2021 water use?

- Your Login and Password are provided in a letter that is sent to the diverter of record for each property
- Go to rms.waterboards.ca.gov to log in to your account
- Submit your report by April 1, 2022 (All reports are due, regardless of the water right type)

2020	2021	2022	2023
January	January	January	January
February	February	February	February
March	March	March	March
April	April	April	April
May	May	May	May
June	June	June	June
July	July	July	July
August	August	August	August
September	September	September	September
October	October	October	October
November	November	November	November
December	December	December	December



#### Water Use Reporting Periods

### Plans for Grizzly Island Wildlife Area 2022 Summer Work and Season Improvements

As part of a cooperative effort between California Department of Fish and Wildlife and the California Waterfowl Association, managers are continuing the restoration of Grizzly Island Wildlife Area (GIWA) and Joice Island. In 2021, more than 475 acres of waterfowl nesting habitat was improved as well as expanding brood pond habitat. The 2022 work year is shaping up to be a big year for GIWA, as efforts continue in the ongoing improvements for waterfowl brood and nesting habitat and the three-year overhaul of Pond 12 – the wildlife area's primary sanctuary. In 2021, the pump damaged by the 2019 wildfire was replaced along with several of the damaged pipes. Infrastructure improvements will continue this year, along with significant grading, discing, and pond bottom work. Improvements have already resulted in progress, as the recently concluded 2021 season was the first year since the fire that Pond 12 has been fully flooded.

Robert Eddings, CWA Manager for the Suisun Marsh and Bay Delta Region had this to say about the wildlife area: "Everyone who hunted blinds near Pond 12 noticed the decline in the number of ducks and realized how important that sanctuary is on Grizzly Island." Eddings went on to state that he expects to see more ducks in future seasons once these improvements and restoration efforts are complete.

This season, hunters at Grizzly Island may have noticed the change from the past year's Phragmites eradication work. Most Phragmites are nonnative grasses which dominate spaces that could be used to grow more productive food or habitat providing plants useful to waterfowl and other wildlife. It was estimated that in 2019, 2,000 acres of the 5,500 acres of flooded habitat was taken over by Phragmites. In 2022, work will be a continuation of the last few year's control efforts on the wildlife area which should help promote more productive wetlands and more waterfowl on the landscape in future years.

Joice Island also will see a continuation of habitat restoration efforts after the 2019 wildfire wiped out much of the plant life and damaged infrastructure. Ponds at the south end of Joice Island hold many birds in the sanctuary zone which is a critical feature of any successful wildlife area. Swale improvements and control efforts for the problematic Russian Thistle are some of the upgrades planned for Joice Island in 2022, marking an end to neglect of one of Suisun Marsh's most critical habitat areas on public lands.



## A "Blue Carbon" Approach to Managing Brackish Wetlands

Jesirae Collins, SRCD Biologist

Carbon dioxide  $(CO_2)$  is a naturally occurring gas generated by human and animal respiration. It is a vital greenhouse gas that helps trap heat in the atmosphere, and it is used by plants for photosynthesis.  $CO_2$  is essential for survival of life on Earth; however, human influence including the burning of fossil fuels has raised the level of  $CO_2$  in Earth's atmosphere consistently for more than 100 years. While  $CO_2$  has a low Global Warming Potential (GWP) compared to other greenhouse gases, it accounts for about 80% of greenhouse gases in the air and can remain in the atmosphere for centuries.

### What is Blue Carbon?

Blue carbon is the term used for atmospheric carbon that is captured and stored by the world's ocean and coastal ecosystems. Coastal wetlands, like mangroves, tidal marshes, and seagrass habitats, provide a natural way of reducing the amount of atmospheric  $CO_2$  concentrations that contribute to climate change through sequestration (or taking in) of this carbon via photosynthesis (**Figure 1**; Howard et al. 2017). Blue carbon ecosystems capture atmospheric carbon and store it in the ground at rates up to 10 times greater than a forest on a per area basis (**Figure 2**; McLeod et al. 2011).



Figure 1. In intact coastal wetlands (from left to right: mangroves, tidal marshes, and seagrasses), carbon is taken up via

### **Blue Carbon Benefits for Suisun Marsh Landowners**

In the face of climate change, businesses are making bold, net-zero carbon commitments and driving rapid growth of the carbon credit market. Businesses achieve net-zero greenhouse gas emissions by reducing emissions or by purchasing carbon credits equal to their emissions. Each carbon credit represents the removal (or avoided emissions) of one metric ton of carbon dioxide from the atmosphere. Blue carbon presents an opportunity for landowners to generate carbon credits by participating in wetland projects that have a climate benefit (increase sequestration or reduce emissions) (**Figure 3**; NOAA). These mitigation projects, known as carbon offsets, result in the generation of a carbon credit which companies can trade or sell to mitigate their carbon footprint. In the future, Suisun Marsh landowners may be able to use managed wetland moist-soil management practices to mitigate climate change while maintaining the substantial fish and wildlife habitat values and bio-



### Can we manage Suisun wetlands to increase climate benefit?

A new study led by USGS scientists, SRCD, and the California Waterfowl Association will test best management practices (BMPs) for sequestering carbon in seasonally-managed, semi-permanent, and tidal wetlands in Suisun Marsh. If carbon sequestration in Suisun Marsh is similar to the SF Bay tidal salt marshes (Callaway et al. 2012), the region has the potential to sequester 18,000 metric tons per year. However, the benefit of specific hydrological management practices and their climate mitigation potential remains largely unstudied in brackish wetlands. During this 3-year project (2022-2024) on Lower Joice Island, we will test management practices that optimize carbon sequestration while achieving wildlife habitat objectives to inform how management of brackish marshes affects the carbon balance. We are in the veery early stages of understanding the role that brackish wetlands can play in climate change mitigation, but this study will be one of the first assess the effectiveness of different BMPs and suggest an approach to maximize carbon sequestration in brackish habitats.





## Meet the Newest SRCD Staff Member — Jason Hagani

I am a recent Master's student graduate from Columbia University in New York with a degree in Ecology & Conservation Biology. My previous research has focused extensively on human -wildlife conflicts and the spatial ecology of animals -I've studied everything from turtles in Connecticut to mountain lions in California. When I'm not in the field or running statistical models, you can probably find me hiking in a national park, indulging my passion for nature photography, or playing a round of golf.



# **2022** Pest Weed Control Program Changes

The goal of the SRCD Pest Weed Control Program is to control established invasive weeds and prevent establishment and expansive of new pest species. SRCD offers advice on options to control invasive species, including chemical purchases and application practices, and seeks to provide cost-share funding when available. Unfortunately, there will be no cost share for this year's programs. SRCD manages two primary invasive weed control programs in the Marsh.

#### **Phragmites Program**

Due to supply chain shortages of Glyphosate, the SRCD Phragmites Control Program will be significantly reduced or not conducted this year. SRCD is focusing on implementing a limited 2022 Aerial Spray Program, but there will likely not be a hand control program. SRCD encourages landowners to treat Phragmites patches on their properties with any Glyphosate they are able to purchase but to start shopping now!

#### **Lepidium Program**

The SRCD Lepidium control Program will continue in the spring of 2022. For interested landowners, SRCD will coordinate treatments by a certified applicator and will also have an option for landowner to purchase Telar and complete applications individually.

### **SRCD Update**

### 2022 RGP3 Work Permits

The 2022 work season permits have been sent out to the primary contact of each club. SRCD will submit all permits received during each month at the end of the month. Get your permits in early to make sure you are approved for work! The forms are also available on our website at:

www.suisunrcd.org/permits

### The PAI Program Returns!

The cost-share grant program returns in 2022! The Preservation Agreement Implementation (PAI) provides grants to improve managed wetland facilities, operational efficiency, and water management capabilities. Instructions for each cost-share program specify which types of habitat improvements are eligible. Participation letters will be sent to landowners, and see the website at: <u>www.suisunrcd.org/</u> <u>programs</u>

#### **Portable Pump Program**

The Portable Pump Program continues this year with drainage pumps available to landowners at a subsidized reduced cost to enhance marsh habitats. Water managers oversee operation, maintenance, and distribution. Pumps are available for drainage operations (leach cycles). For details on costs and leasing a pump, contact your water manager.

# Pacific Flyway Center Awarded \$1.5M Grant for A Walk in The Marsh!

On October 27, 2021, the Delta Conservancy awarded the Pacific Flyway Fund a \$1.5M Proposition 68 grant to create a "A Walk in the Marsh" at the site of the future Pacific Flyway Center (PFC). The PFC was the vision of Mr. Ken Hofmann to create a world-class conservation and education center to inspire and educate future generations. The PFC will be located in Suisun Marsh along I-680 south of Gold Hills Road on 845 acres of uplands and managed wetlands.

The Delta Conservancy Community and Economic Enhancement Grant Program (Proposition 68) provides funding to projects, like The Pacific Flyway Center, that enhance and protect Delta Communities *"in order to sustain the Delta's heritage and enhance the unique values of the Delta."* These projects also focus on increasing public access to recreational opportunities in order to promote a robust Delta economy. The projects and programs that Proposition 68 funds include recreation and tourism, historic and cultural preservation, and environmental education.

### How Will This Grant Be Used?

The grant will be used to fund the a variety of features to enhance Phase 1 of the Pacific Flyway Center: "The Marsh Walk." This includes the pathway trail system and more than 2 miles of trails, shade structures, visitor parking, and more amenities to be constructed.

### What is A Walk In The Marsh?

This area, previously used for agriculture by the Garibaldi family and managed as a waterfowl sanctuary by the Department of Fish and Wildlife, will enhance important habitat to birds that migrate through the region each year. Improvements will include new ponds, restored vegetation, and other valuable enhancements for waterfowl, shorebirds and other wetland-dependent wildlife.

With the goal of creating future stewards of the planet, the Pacific Flyway Center will give children and students a place not just to learn about this environment but provide a place to explore it which is how children learn best. There will be interactive bird, plant, and wildlife identification apps, dipping ponds where visitors can gather and examine invertebrates that are vital to the marsh food web, and nature hikes to explore the habitats. *The* 



*Walk in the Marsh* will offer access for all visitors. Stretching almost a mile and taking visitors deep into the wetlands, it will include an extensive series of winding paths with interpretive displays and raised boardwalks featuring viewing blinds for bird and wildlife watching.



### **Chinook Salmon Gate Monitoring - Increased Diversion Restrictions**

The Suisun Resource Conservation District will continue gate monitoring for the Spring Run of Chinook Salmon starting **February 21 through March 31, 2022.** SRCD will be checking all intake gates in Chinook Closure Areas by boat for the duration of the monitoring period. Intake gate stem measurements collected during the 2013 spring closures will be used to ensure that these gates are closed. This is a reminder that water management to intake water should be conducted prior to these restrictions taking effect.



Landowners are prohibited from diverting unscreened water from the slough and should an intake be found out of compliance, SRCD is required to report the occurrence to the appropriate agencies. The landowner will be contacted and asked to reduce their intake immediately.

Compliance with these permit conditions is essential for Suisun Marsh wetland management; otherwise, the permit for the entire Marsh could be jeopardized if the diversion restrictions are not followed during the Spring Run of Chinook Salmon gate monitoring period.