



# Allocations

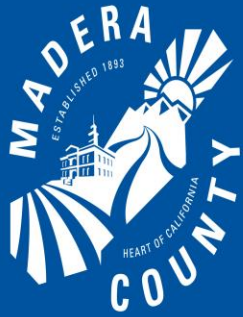
**May 27, 2021 (Office Hours)**  
**June 1, 2021 (FB, MAWA)**  
**June 8, 2021 (County GSAs)**

- Outreach regarding the allocation
- Option A (Original with 2015 ETAW)
- Option B (2020 ETAW)
- Option C (2020 ETAW, only irrigated acres)



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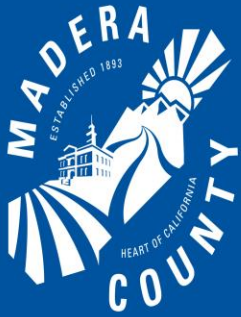
# Outreach on Allocations

- May 17 and 23, 2019 – Advisory Committee
- September 5, 2019 – Advisory Committee
- February 6, 2020 – Advisory Committee
- June 4, 2020 – Advisory Committee
- August 6, 2020 – Advisory Committee
- September 3, 2020 - Advisory Committee
- October 14, 2020 – Advisory Committee
- November 12, 2020 – Advisory Committee
- November 17, 2020 – County GSAs
- December 15, 2020 – County GSAs
- Six Workshops on Satellite ET
- May 11, 2021 – County GSAs with Allocations
- May 13, 2021 – Office Hours on Allocations
- May 18, 2021 – County GSAs
- **May 27, 2021 – County GSAs Office Hours**
- **June 1, 2021 – County GSAs, FB and MAWA Workshop**
- **June 8, 2021 – County GSAs**



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# Water Terms

- **Applied Water**
  - Volume delivered through irrigation system
  - Water flows to deep percolation and runoff as well as to evapotranspiration, depending on irrigation efficiency
  - Measured with meters
- **Evapotranspiration of Applied Water**
  - Volume of applied water transpired by plants and evaporated from the soil (i.e., consumptive use)
  - Less than Applied Water
  - Measured with satellite data





## Historical ETAW

- Almonds – 34 inches per year
- Pistachios – 30 inches per year
- Grapes – 20 inches per year
  
- Values vary with cultural practices, age and varieties.



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# Sustainable Yield and Transitional Water Buckets

## Exhibit A – Based on 2015 ETAW

Exhibit A							
Year	Madera County GSAs						
	Madera Subbasin		Chowchilla Subbasin		Delta Mendota Subbasin		
	SY	TW	SY	TW	SY	TW	
2020	90,000	101,000	22,500	58,110	1,500	2,000	2%
2021	90,000	98,980	22,500	56,948	1,500	1,960	2%
2022	90,000	96,960	22,500	55,786	1,500	1,920	2%
2023	90,000	94,940	22,500	54,623	1,500	1,880	2%
2024	90,000	92,920	22,500	53,461	1,500	1,840	2%
2025	90,000	90,900	22,500	52,299	1,500	1,800	2%

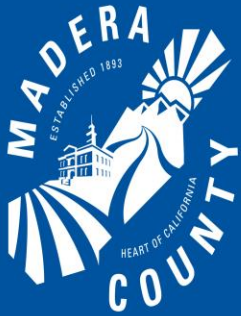
## Exhibit A – Based on 2020 ETAW

Exhibit A							
Year	Madera County GSAs						
	Madera Subbasin		Chowchilla Subbasin		Delta Mendota Subbasin		
	SY	TW	SY	TW	SY	TW	
2020	90,000	113,000	22,500	63,400	1,500	2,000	2%
2021	90,000	110,740	22,500	62,132	1,500	1,960	2%
2022	90,000	108,480	22,500	60,864	1,500	1,920	2%
2023	90,000	106,220	22,500	59,596	1,500	1,880	2%
2024	90,000	103,960	22,500	58,328	1,500	1,840	2%
2025	90,000	101,700	22,500	57,060	1,500	1,800	2%



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## Option A Math – 2015 ETAW with farm units allowing never irrigated land

Madera County GSA in Madera Subbasin 2021

- To calculate Sustainable Yield (SY):

$$\frac{90,000 \text{ AF}}{(85,000 \text{ ac} + 35,000 \text{ ac})}$$

$$= 0.75 \text{ ft or } 9 \text{ inches total of SY}$$

- To calculate Transitional Water (TW):

$$\frac{98,980 \text{ AF}}{(85,000 \text{ ac})}$$

$$= 1.16 \text{ ft or } 14 \text{ inches total of TW}$$

Total Allocation for Irrigated Land is:

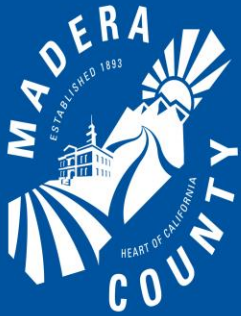
$$= 9 + 14 = 23 \text{ inches}$$



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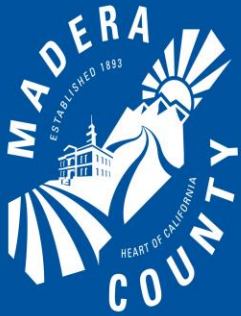
# Option A

Madera County GSA: Madera Subbasin							
	GSA Allocations (af/yr)		Per-Acre Allocation (inches/ac/yr)				
Year	SY	TW	B-SY	Re-SY	TW	Total for Irr.	Total Non-irr.
2020	90,000	101,000	6	3	14.3	23.3	9
2021		98,980			14.0	23.0	9
2022		96,960			13.7	22.7	9
2023		94,940			13.4	22.4	9
2024		92,920			13.1	22.1	9
2025		90,900			12.8	21.8	9
Irrigated Acres = 85,000 Can access B-SY, Re-SY and TW							
Non-Irr. Opt-in acres = 35,000 Can access only B-SY and Re-SY							
Total GSA acres = 185,000							
<b>Per-Acre Allocation Terms:</b>							
<p><b>Base Sustainable Yield (B-SY)</b> - the quantity of sustainable yield of native groundwater when shared equally over all GSA acres at 6 in/ac/yr.</p>							
<p><b>Re-allocated Sustainable Yield (Re-SY)</b> - the amount of Base Sustainable Yield remaining when considering GSA parcels that have chosen to opt-out. The quantity is divided and shared equally among the remaining opt-in parcels and added to the Base Sustainable Yield, estimated at 3 in/ac/yr.</p>							
<p><b>Transition Water (TW)</b> - the annual quantity available to irrigated or non-irrigated lands. This quantity will decrease annually until zero. "Never-irrigated" lands are not eligible for Transition Water.</p>							



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# Option A

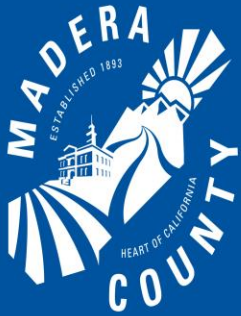
Madera County GSA: Chowchilla Subbasin							
Year	GSA Allocations (af/yr)		Per-Acre Allocation (inches/ac/yr)				
	SY	TW	B-SY	Re-SY	TW	Total for Irr.	Total Non-irr.
2020	22,500	58,110	6	0.5	18.4	24.9	6.5
2021		56,948			18.0	24.5	6.5
2022		55,786			17.6	24.1	6.5
2023		54,623			17.2	23.7	6.5
2024		53,461			16.9	23.4	6.5
2025		52,299			16.5	23.0	6.5
Irrigated Acres = 38,000 Can access B-SY, Re-SY and TW							
Non-Irr. Opt-in acres = 3,800 Can access only B-SY and Re-SY							
Total GSA acres = 45,000							
<b>Per-Acre Allocation Terms:</b>							
<p><b>Base Sustainable Yield (B-SY)</b> - the quantity of sustainable yield of native groundwater when shared equally over all GSA acres at 6 in/ac/yr.</p> <p><b>Re-allocated Sustainable Yield (Re-SY)</b> - the amount of Base Sustainable Yield remaining when considering GSA parcels that have chosen to opt-out. The quantity is divided and shared equally among the remaining opt-in parcels and added to the Base Sustainable Yield, estimated at 0.5 in/ac/yr.</p> <p><b>Transition Water (TW)</b> - the annual quantity available to irrigated or non-irrigated lands. This quantity will decrease annually until zero. "Never-irrigated" lands are not eligible for Transition Water.</p>							



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# Option A

Madera County GSA: Delta Mendota Subbasin							
Year	GSA Allocations (af/yr)		Per-Acre Allocation (inches/ac/yr)				
	SY	TW	B-SY	Re-SY	TW	Total for Irr.	Total Non-irr.
2020	1,500	2,000	6	2.6	11.4	20.0	0.0
2021		1,960			11.2	19.8	0.0
2022		1,920			11.0	19.6	0.0
2023		1,880			10.7	19.3	0.0
2024		1,840			10.5	19.1	0.0
2025		1,800			10.3	18.9	0.0
Irrigated Acres = 2,100    Can access B-SY, Re-SY and TW							
Non-Irr. Opt-in acres = 0    Can access only B-SY and Re-SY							
Total GSA acres = 3,000							
<b>Per-Acre Allocation Terms:</b>							
<p><b>Base Sustainable Yield (B-SY)</b> - the quantity of sustainable yield of native groundwater when shared equally over all GSA acres at 6 in/ac/yr.</p>							
<p><b>Re-allocated Sustainable Yield (Re-SY)</b> - the amount of Base Sustainable Yield remaining when considering GSA parcels that have chosen to opt-out. The quantity is divided and shared equally among the remaining opt-in parcels and added to the Base Sustainable Yield, estimated at 2.6 in/ac/yr.</p>							
<p><b>Transition Water (TW)</b> - the annual quantity available to irrigated or non-irrigated lands. This quantity will decrease annually until zero. "Never-irrigated" lands are not eligible for Transition Water.</p>							



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# Options for Ranchers with Option A

1. Don't Opt In  
Keep ranching and access water for cattle and domestic needs (no fees)
2. Opt in for SY  
Have land that is leased to a farm unit (Admin Fee and SY fee)



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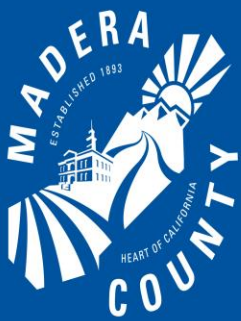
# Options for Growers with Option A

1. Opt in for SY
2. Opt in for TW



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## Options for Growers with Option B - 2020 ETAW with farm units allowing never irrigated land

Madera County GSA in Madera Subbasin 2021

- To calculate Sustainable Yield (SY):

90,000 AF

(85,000 ac + 35,000 ac)

= 0.75 ft or 9 inches total of SY

- To calculate Transitional Water (TW):

110,740 AF

(85,000 ac)

= 1.3 ft or 15.6 inches total of TW

Total Allocation for Irrigated Land is:

= 9 + 15.6 = 24.6 inches



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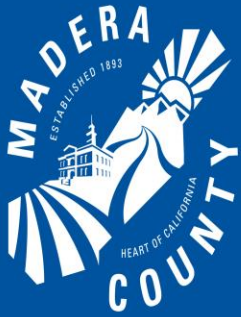
# Option B

Madera County GSA: Madera Subbasin							
	GSA Allocations (af/yr)		Per-Acre Allocation (inches/ac/yr)				
Year	SY	TW	B-SY	Re-SY	TW	Total for Irr.	Total Non-irr.
2020	90,000	113,000	6	3	16.0	25.0	9
2021		110,740			15.6	24.6	9
2022		108,480			15.3	24.3	9
2023		106,220			15.0	24.0	9
2024		103,960			14.7	23.7	9
2025		101,700			14.4	23.4	9
Irrigated Acres = 85,000			Can access B-SY, Re-SY and TW				
Non-Irr. Opt-in acres = 35,000			Can access only B-SY and Re-SY				
Total GSA acres = 185,000							
<b>Per-Acre Allocation Terms:</b>							
<b>Base Sustainable Yield (B-SY)</b> - the quantity of sustainable yield of native groundwater when shared equally over all GSA acres at 6 in/ac/yr.							
<b>Re-allocated Sustainable Yield (Re-SY)</b> - the amount of Base Sustainable Yield remaining when considering GSA parcels that have chosen to opt-out. The quantity is divided and shared equally among the remaining opt-in parcels and added to the Base Sustainable Yield, estimated at 3 in/ac/yr.							
<b>Transition Water (TW)</b> - the annual quantity available to irrigated or non-irrigated lands. This quantity will decrease annually until zero. "Never-irrigated" lands are not eligible for Transition Water.							



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# Option B

Madera County GSA: Chowchilla Subbasin							
Year	GSA Allocations (af/yr)		Per-Acre Allocation (inches/ac/yr)				
	SY	TW	B-SY	Re-SY	TW	Total for Irr.	Total Non-irr.
2020	22,500	63,400	6	0.5	20.0	26.5	6.5
2021		62,132			19.6	26.1	6.5
2022		60,864			19.2	25.7	6.5
2023		59,596			18.8	25.3	6.5
2024		58,328			18.4	24.9	6.5
2025		57,060			18.0	24.5	6.5
Irrigated Acres =			38,000	Can access B-SY, Re-SY and TW			
Non-Irr. Opt-in acres =			3,800	Can access only B-SY and Re-SY			
Total GSA acres =			45,000				
<b>Per-Acre Allocation Terms:</b>							
<p><b>Base Sustainable Yield (B-SY)</b> - the quantity of sustainable yield of native groundwater when shared equally over all GSA acres at 6 in/ac/yr.</p>							
<p><b>Re-allocated Sustainable Yield (Re-SY)</b> - the amount of Base Sustainable Yield remaining when considering GSA parcels that have chosen to opt-out. The quantity is divided and shared equally among the remaining opt-in parcels and added to the Base Sustainable Yield, estimated at 0.5 in/ac/yr.</p>							
<p><b>Transition Water (TW)</b> - the annual quantity available to irrigated or non-irrigated lands. This quantity will decrease annually until zero. "Never-irrigated" lands are not eligible for Transition Water.</p>							



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# Option B

Madera County GSA: Delta Mendota Subbasin							
	GSA Allocations (af/yr)		Per-Acre Allocation (inches/ac/yr)				
Year	SY	TW	B-SY	Re-SY	TW	Total for Irr.	Total Non-irr.
2020	1,500	2,000	6	2.6	11.4	20.0	0.0
2021		1,960			11.2	19.8	0.0
2022		1,920			11.0	19.6	0.0
2023		1,880			10.7	19.3	0.0
2024		1,840			10.5	19.1	0.0
2025		1,800			10.3	18.9	0.0
Irrigated Acres = 2,100			Can access B-SY, Re-SY and TW				
Non-Irr. Opt-in acres = 0			Can access only B-SY and Re-SY				
Total GSA acres = 3,000							
<b>Per-Acre Allocation Terms:</b>							
<b>Base Sustainable Yield (B-SY)</b> - the quantity of sustainable yield of native groundwater when shared equally over all GSA acres at 6 in/ac/yr.							
<b>Re-allocated Sustainable Yield (Re-SY)</b> - the amount of Base Sustainable Yield remaining when considering GSA parcels that have chosen to opt-out. The quantity is divided and shared equally among the remaining opt-in parcels and added to the Base Sustainable Yield, estimated at 2.6 in/ac/yr.							
<b>Transition Water (TW)</b> - the annual quantity available to irrigated or non-irrigated lands. This quantity will decrease annually until zero. "Never-irrigated" lands are not eligible for Transition Water.							



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# Options for Ranchers with Option B

1. Don't Opt In  
Keep ranching and access water for cattle and domestic needs (no fees)
2. Opt in for SY  
Have land that is leased to a farm unit (Admin Fee and SY fee)



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# Options for Growers with Option B

1. Opt in for SY
2. Opt in for TW



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# Options for Growers with Option C

## Madera County GSA in Madera Subbasin 2021

- To calculate Sustainable Yield (SY):

90,000 AF

(85,000 ac)

= 1.05 ft or 13 inches total of SY

- To calculate Transitional Water (TW):

110,740 AF

(85,000 ac)

= 1.3 ft or 15.6 inches total of TW

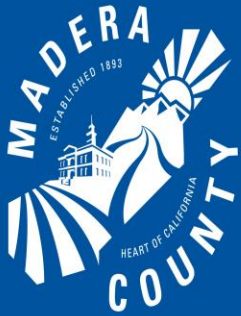
Total Allocation for Irrigated Land is:

= 13 + 15.6 = 28.6 inches



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# Option C

Madera County GSA: Madera Subbasin							
Year	GSA Allocations (af/yr)		Per-Acre Allocation (inches/ac/yr)				
	SY	TW	B-SY	Re-SY	TW	Total for Irr.	Total Non-irr.
2020	90,000	113,000	6	7	16.0	28.7	0
2021		110,740			15.6	28.3	0
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2023		106,220			15.0	27.7	0
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2025		101,700			14.4	27.1	0
Irrigated Acres =			85,000	Can access B-SY, Re-SY and TW			
Non-Irr. Opt-in acres =			0	Can access only B-SY and Re-SY			
Total GSA acres =			185,000				
<b>Per-Acre Allocation Terms:</b>							
<p><b>Base Sustainable Yield (B-SY)</b> - the quantity of sustainable yield of native groundwater when shared equally over all GSA acres at 6 in/ac/yr.</p>							
<p><b>Re-allocated Sustainable Yield (Re-SY)</b> - the amount of Base Sustainable Yield remaining when considering GSA parcels that have chosen to opt-out. The quantity is divided and shared equally among the remaining opt-in parcels and added to the Base Sustainable Yield, estimated at 3 in/ac/yr.</p>							
<p><b>Transition Water (TW)</b> - the annual quantity available to irrigated or non-irrigated lands. This quantity will decrease annually until zero. "Never-irrigated" lands are not eligible for Transition Water.</p>							



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# Option C

Madera County GSA: Chowchilla Subbasin							
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Year	SY	TW	B-SY	Re-SY	TW	Total for Irr.	Total Non-irr.
2020	22,500	63,400	6	1.1	20.0	27.1	0
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<p><b>Re-allocated Sustainable Yield (Re-SY)</b> - the amount of Base Sustainable Yield remaining when considering GSA parcels that have chosen to opt-out. The quantity is divided and shared equally among the remaining opt-in parcels and added to the Base Sustainable Yield, estimated at 0.5 in/ac/yr.</p>							
<p><b>Transition Water (TW)</b> - the annual quantity available to irrigated or non-irrigated lands. This quantity will decrease annually until zero. "Never-irrigated" lands are not eligible for Transition Water.</p>							



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# Option C

Madera County GSA: Delta Mendota Subbasin							
Year	GSA Allocations (af/yr)		Per-Acre Allocation (inches/ac/yr)				
	SY	TW	B-SY	Re-SY	TW	Total for Irr.	Total Non-irr.
2020	1,500	2,000	6	2.6	11.4	20.0	0
2021		1,960			11.2	19.8	0
2022		1,920			11.0	19.6	0
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Total GSA acres = 3,000							
<b>Per-Acre Allocation Terms:</b>							
<p><b>Base Sustainable Yield (B-SY)</b> - the quantity of sustainable yield of native groundwater when shared equally over all GSA acres at 6 in/ac/yr.</p>							
<p><b>Re-allocated Sustainable Yield (Re-SY)</b> - the amount of Base Sustainable Yield remaining when considering GSA parcels that have chosen to opt-out. The quantity is divided and shared equally among the remaining opt-in parcels and added to the Base Sustainable Yield, estimated at 2.6 in/ac/yr.</p>							
<p><b>Transition Water (TW)</b> - the annual quantity available to irrigated or non-irrigated lands. This quantity will decrease annually until zero. "Never-irrigated" lands are not eligible for Transition Water.</p>							



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# Options for Ranchers with Option C

1. Keep ranching and access water for cattle and domestic needs (no fees)



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# Options for Growers with Option C

1. Opt in for SY
2. Opt in for TW



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# Summary of Allocation Options



Option	ETAW per acre in inches in 2021	Notes
Option A	23	2015 ETAW with farm units allowing never irrigated acres as part of farm unit
Option B	24.6	2020 ETAW with farm units allowing never irrigated acres as part of farm unit
Option C	28.6	2020 ETAW with no never irrigated acres in farm units



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# Recommendation Notes

Grower feedback and outreach

Many hopes for water market, but this requires an allocation, monitoring and compliance

Options for rangeland include payments to never-irrigated acres under SALC



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# Recommendation

Adopt resolution for Allocations with Option C



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