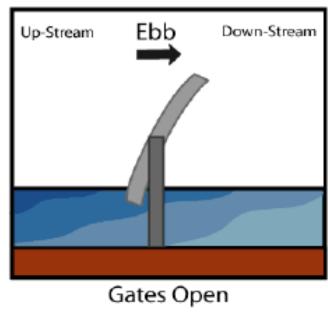






SMSCG Side View





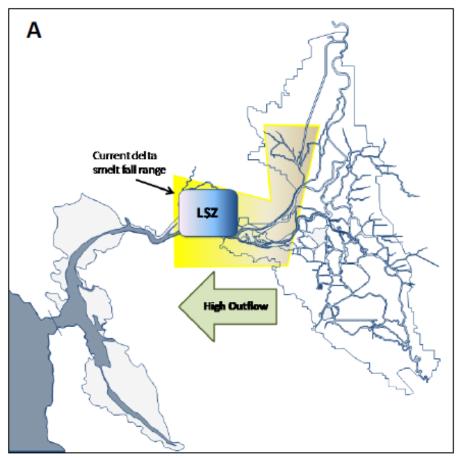
Suisun Marsh Salinity Control Gates Hypotheses

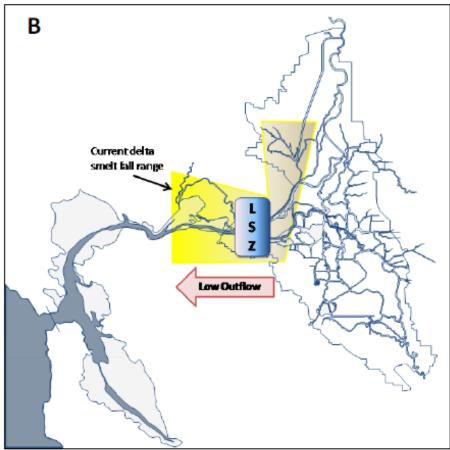




Strategic Operation of SMSCG During Dry Seasons Will:

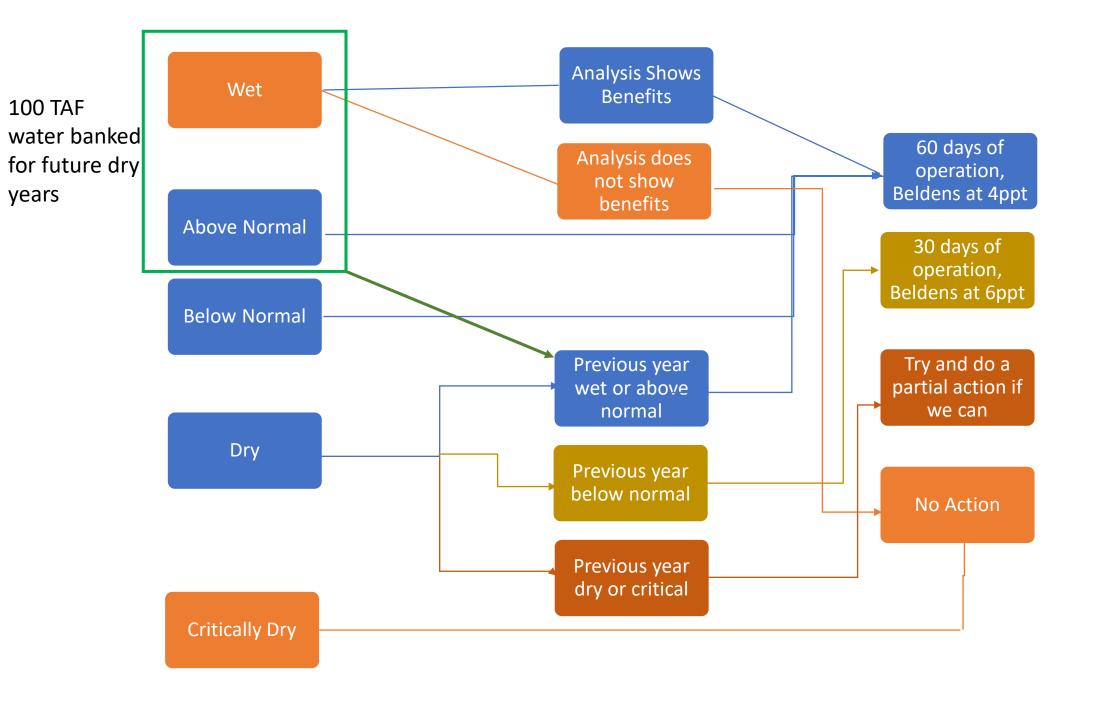
- Improve habitat conditions in Suisun Marsh (\$\\$\\$ salinity)
- Provide Smelt with greater access to more complex habitat, temperature refuges & better food resources.
- Improve Smelt feeding, growth, survival, health and life history diversity.

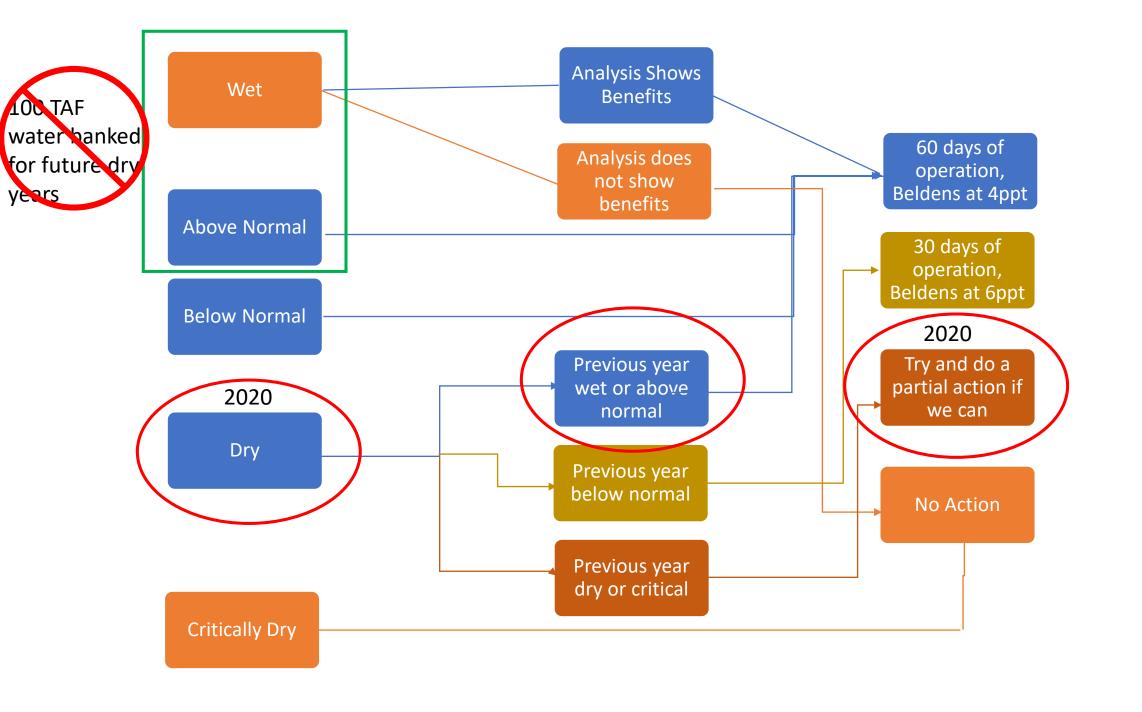




Regulatory Mandates

- D-1641
 - Operations Oct-May
- 2019 BiOp
 - Included in "Delta Smelt Summer-Fall Habitat actions"
 - Operations for up to 60 days Jun-Oct of Below Normal and Above Normal years. Wet years if preliminary analysis shows expected benefits
- 2020 ITP
 - Includes **Dry** year actions
 - No wet year action





Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		Hydrologic forecast, DCG meeting	Plan field season								
Normal gate ops					Special gate ops		Normal gate ops				
					Monitoring					Analyze result	S
Write report on last year											

Predictions

Modeling

Water Quality sondes

IEP surveys Special clam surveys

Delta Smelt Cages

Habitat Conditions	Relative to Base	Relative to River Region	Relative to western marsh
1	Highor	n /o	NA
Average Daily Net Delta Outflow	Higher	n/a	
Surface area of the fall LSZ	Higher	Higher	NA
Salinity	Lower	Higher	Lower
Temperature	Neutral	Lower	neutral
Turbidity	Neutral	Higher	ý
Food Web Responses			
Average Phytoplankton Biomass	Neutral	Higher	Neutral
Diatom Biomass	Neutral	Higher	Neutral
Average Microcystis Biomass	Neutral	Lower	Neutral
Zooplankton biomass	Neutral	Lower	Neutral
Bivalve Assemblage	More Corbicula	More Potamocorbula	More Corbicula
Fish assemblage	Different	Different	Different
Delta Smelt (DS) Responses			
DS distribution	Westward	n/a	n/a
DS growth, survival, fecundity in fall	Higher	Higher	Higher
DS health and condition	Better	Better	Better
DS Recruitment the next year	Better	n/a	NA
DS Population life history variability	Better	n/a	NA

Predictions

Modeling

Water Quality sondes

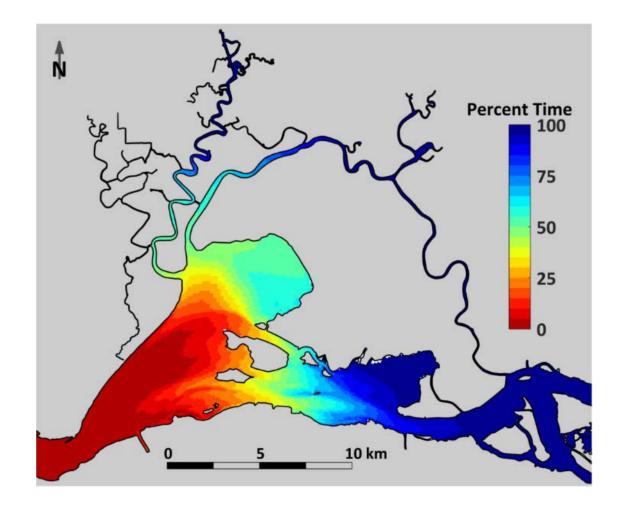
IEP surveys Special clam surveys

Delta Smelt Cages

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Modeling

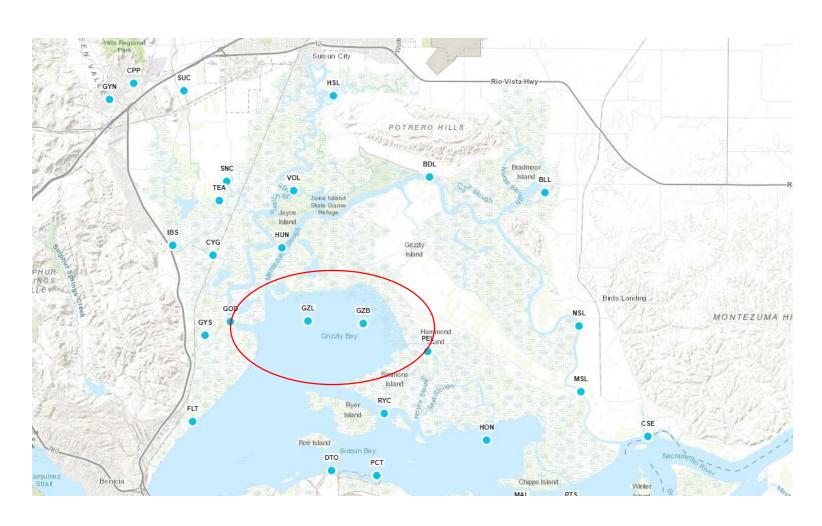
- Predict effect of gate operations on EC at Beldens
- Location of salinity field
- Water cost



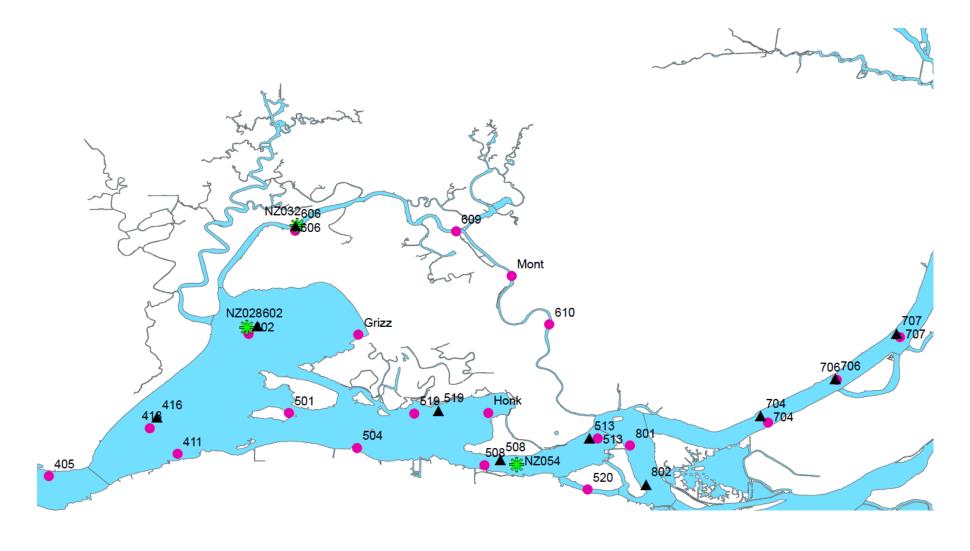


Water Quality Monitoring

- EMP
- Sondes
- Extra sondes in shallows of Grizzly Bay?

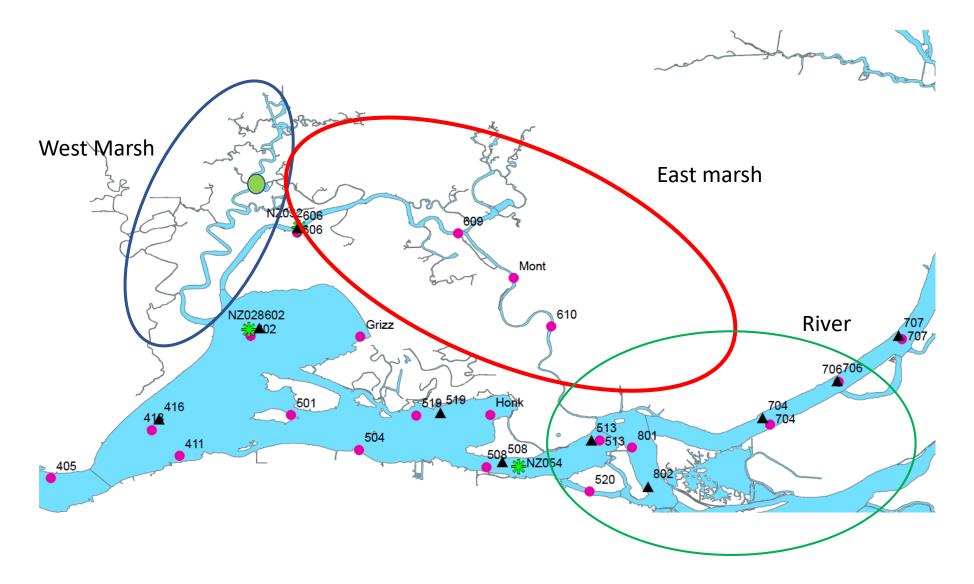


Zooplankton 2018-2019





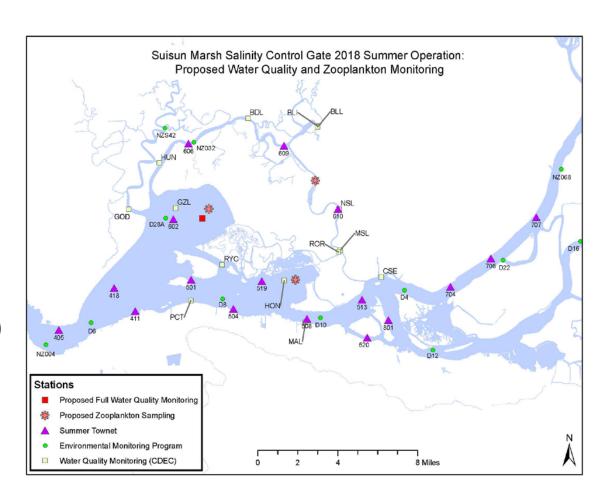
Zooplankton 2020





Biological Monitoring

- Fish (existing surveys)
 - EDSM,
 - Suisun Marsh Survey,
 - Summer Townet,
 - FMWT
- Zooplankton
 - Existing surveys (FMWT, Townet, FRP, EMP)
 - Extra stations from Townet and FMWT
- Phytoplankton
 - Chlorophyll
 - Productivity SFU contract
 - EMP, extra sampling
- Clams Surveys before and after, growth rates





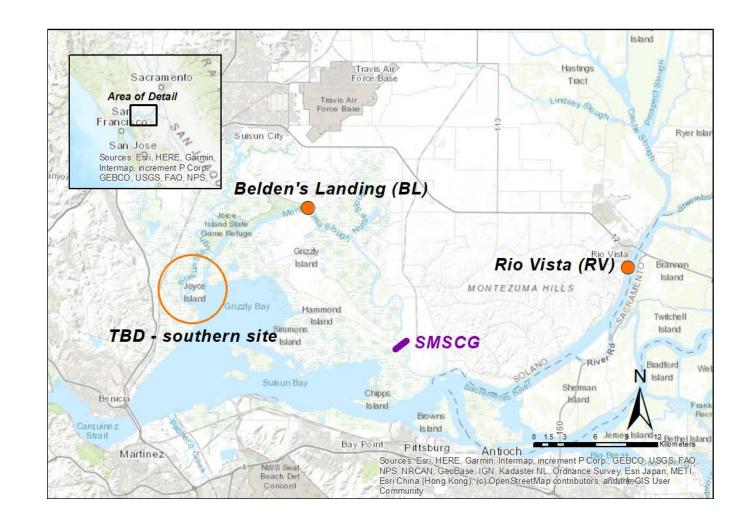
Clams



Biotic Habitat	East Marsh	River	West Marsh
Chlorophyll-a	Continuous: Existing Stations (GOD, HUN, BDL, NSL, MSL, HON, TYC, PCT) + 1 new station in Grizzly Bay	Continuous: Existing stations PCT, MAL, CSE, RVB, LIS	
Microcystis Presence/Absence	EMP Stations (n = 3), monthly; STN/FMWT stations, biweekly + 3 additional stations (n = 8)	EMP (n = 2), monthly: STN/FMWT stations, biweekly (n = 5)	
Zooplankton abundance	EMP Stations (n = 3), monthly; STN/FMWT stations, biweekly + 3 additional stations (n = 8)	EMP (n = 2), monthly: STN/FMWT stations, biweekly (n = 5)	
Bivalve biomass & community	EMP, monthly: D7; Supplemental marsh sampling	EMP, monthly: D4	
Bivalve survival & growth	Special Study (UCD)	None	
Fish Community	STN/FMWT/EDS M Suisun Marsh Survey	STN/FMWT/EDSM	

Smelt Cages

- Experimental Design
 - Before-during-after
 - Salty marsh fresh marsh river



Thoughts? Questions?