

Weekly Assessment of CVP and SWP Delta Operations on ESA-listed Species

1. Operational Conditions

See Weekly Fish and Water Operation Outlook document for October 20 – October 26 and Attachments A and B for hydrological conditions.

2. Executive Summary

a. Winter-run Chinook Salmon

No loss of natural winter-run Chinook salmon (by length at date, LAD) has occurred in the past week at the State or Federal fish salvage facilities. Loss of natural winter-run Chinook salmon at the Central Valley Project (CVP) and State Water Project (SWP) fish collection facilities is unlikely to occur over the next week. 0-1% of juvenile natural winter-run Chinook salmon from brood year (BY) 20 are estimated to be present in the Delta. The Delta Cross Channel (DCC) gates closure for the Lower Mokelumne River pulse flow reduces exposure of winter-run Chinook salmon juveniles that are potentially present in the Sacramento River near the DCC gates into the interior Delta. The effects of DCC closure would be positive, if juveniles are present.

b. Spring-run Chinook salmon

No loss of natural Central Valley (CV) spring-run Chinook salmon has occurred in the past week at the State and Federal fish salvage facilities. Loss of Central Valley spring-run Chinook salmon at the CVP and SWP fish collection facilities is unlikely to occur over the next week. There are no juvenile natural spring-run Chinook salmon from BY 20 near the DCC gates; CV spring-run Chinook salmon adults are building redds and spawning upstream. The exposure and effects of DCC closure are unlikely for natural spring-run Chinook salmon.

c. Central Valley Steelhead

No loss of natural California CV (CCV) steelhead has occurred in the past week at the State and Federal fish salvage facilities. Loss of Central Valley steelhead at the Central Valley Project (CVP) and State Water Project (SWP) fish collection facilities is unlikely to occur over the next week. 0-1% of juvenile CCV Steelhead are estimated to be present in the Delta. DCC closure reduces exposure to Central Valley steelhead juveniles that are potentially present in the Sacramento River near the DCC gates. The effects of DCC gate closure are likely to be positive if juveniles CCV steelheads are present.

d. DCC gates recommendation

Close the DCC gates at 1600 on October 20 and open at 1000 on October 24 to reduce straying of Mokelumne River fall-run Chinook salmon, attracted by lower

Mokelumne River pulse flows, into the Sacramento River through the DCC. Any juvenile CCV steelhead and winter-run Chinook salmon migrating past the DCC during the closure would benefit from the closure.

3. Winter-run Chinook salmon

- How much loss has occurred in the past week?**
No loss of juvenile winter-run Chinook salmon has occurred in the past week at the CVP and SWP fish salvage facilities.
- What is the distribution of fish within the Delta?**
On 10/20/2020 SaMT estimated 0-1% of juvenile winter-run Chinook salmon were present in the Delta.
- What is the exposure to winter-run Chinook salmon due to DCC gate closure?**
Juvenile winter-run Chinook salmon have not been observed this year near the DCC gates and historical monitoring data indicates that juvenile winter-run Chinook salmon are not in the Delta at this time. Closure of the DCC gates would reduce exposure and possible entrainment of juvenile winter-run Chinook salmon into the Interior Delta via the DCC gates.
- What are the effects to winter-run Chinook salmon due to DCC gate closure?**
It is unlikely juvenile winter-run Chinook salmon are present near the DCC gates. Closure of the gates would positively impact any present juvenile winter-run Chinook salmon.

Supporting Information regarding Exposure of winter-run Chinook salmon

Natural winter-run Chinook salmon distribution estimate for 10/20/2020

<u>Yet to Enter Delta</u>	<u>In Delta</u>	<u>Exited Delta past Chipps Island</u>
99-100%	0-1%	0%

Natural winter-run Chinook salmon average percent of annual emigrating population (LAD) captured at following locations and salvaged at Delta fish facilities by 10/18 between 2005 - 2019

<u>Red Bluff Diversion Dam</u>	<u>Tisdale RST</u>	<u>Knights Landing RST</u>	<u>Sac Trawl (Sherwood)</u>	<u>Chipps Island Trawl</u>	<u>Salvaged at Delta Facilities</u>
60.9%	6.4%	5.2%	0%	0%	0%

Knight's Landing (KLCI) and Sacramento Seine and Trawl (SCI)

No catch indices for juvenile salmonid migration were triggered during the past week.

<u>Date</u>	<u>KLCI</u>	<u>SCI Seine</u>	<u>SCI Trawl</u>	<u>Trigger Exceeded?</u>
10/18/2020	0			No
10/17/2020	0			No
10/16/2020	0	0	0	No
10/15/2020	0	0		No
10/14/2020		0	0	No
10/13/2020	0			No
10/12/2020	0			No

Mean daily flow and percent change (Wilkins Slough, Deer Creek, Mill Creek; cfs from CDEC) and temperature and percent change (Knights Landing; °F from RST)

No warning alerts for juvenile salmonid migration were triggered during the past week.

<u>Date</u>	<u>Wilkins Slough flow (WLK)</u>	<u>Deer Creek flow (DCV)</u>	<u>DCV Δ</u>	<u>Mill Creek flow (MLM)</u>	<u>MLM Δ</u>	<u>Knights Landing temperature (°F)</u>	<u>Alert Triggered</u>
10/18/2020	4043.6	74.0	1.7%	88.0	-0.6%		No
10/17/2020	4089.8	72.8	6.2%	88.5	0.9%	63.9	No
10/16/2020	4291.1	68.5	-2.1%	87.8	-1.5%	63	No
10/15/2020	4460.0	70.0	-1.3%	89.1	-1.6%	62.6	No
10/14/2020	4587.4	70.9	-1.0%	90.6	-0.5%	62.7	No
10/13/2020	4550.2	71.7	-2.4%	91.0	-0.8%	62.5	No
10/12/2020	4526.0	73.4	-0.8%	91.8	-0.5%	61.8	No

Supporting Information regarding DCC Management Effects on winter-run Chinook salmon

10/13/2020 Water Quality Modeling Assumptions:

- 2 DCC closures:
 - a. Closed at 1600 on October 13 and Open at 1000 on October 17
 - b. Closed at 1600 on October 20 and Open at 1000 on October 24
- See Attachment A – Mokelumne River pulse flow plan plot and data

No water quality criteria were exceeded (Attachment B figures 1-4).

STARS model simulations for route-specific entrainment, travel times, and survival for 10/18/2020. Freeport flows for 10/18/2020 were 7,988 cfs.

<u>Metric</u>	<u>DCC</u>	<u>Georgiana Slough</u>	<u>Sacramento River</u>	<u>Sutter and Steamboat</u>
Proportion of Entrainment	5%	28%	41%	24%
Survival	11%	15%	45%	35%
Travel Time	18.28 d	18.88 d	11.73 d	11.88 d

4. Spring-run Chinook salmon

- How much loss has occurred in the past week?**
No loss of juvenile CV spring-run Chinook salmon has occurred in the past week at the CVP and SWP fish salvage facilities.
- What is the distribution of fish within the Delta?**
On 10/20/2020 SaMT estimated 0% of juvenile CV spring-run Chinook salmon were present in the Delta.
- What is the exposure to CV spring-run Chinook salmon due to DCC gate closure?**
No juvenile young-of-year CV spring-run Chinook salmon (LAD) have been observed near the DCC gates and adults are building redds and spawning upstream. Yearling CV spring run Chinook salmon remain in natal tributaries and no environmental criteria indicating the initiation of fish migration behavior has been exceeded. Historical monitoring data does not detect spring-run Chinook salmon in the Delta at this time.
- What are the effects to CV spring-run Chinook salmon due to DCC gate closure?**
The exposure and effects of DCC closure on natural CV spring-run Chinook salmon are similar to winter-run Chinook salmon. Closure of the gates would reduce entrainment of any juvenile CV spring-run Chinook salmon near the DCC gates into the interior Delta.

Supporting Information regarding Exposure of spring-run Chinook salmon

Natural spring-run Chinook salmon distribution estimate for 10/20/2020

<u>Yet to Enter Delta</u>	<u>In Delta</u>	<u>Exited Delta past Chipps Island</u>
100%	0%	0%

Natural spring-run Chinook salmon average percent of annual emigrating population (LAD) captured at following locations and salvaged at Delta fish facilities by 10/18 between 2005 - 2019

<u>Red Bluff Diversion Dam</u>	<u>Tisdale RST</u>	<u>Knights Landing RST</u>	<u>Sac Trawl (Sherwood)</u>	<u>Chipps Island Trawl</u>	<u>Salvaged at Delta Facilities</u>
2%	0%	0%	0%	0%	0%

See additional supporting information found in winter-run Chinook salmon section (section 3.b.).

Supporting Information regarding DCC Management Effects on spring-run Chinook salmon

See additional supporting information in winter-run Chinook salmon section (section 3.b.).

5. California Central Valley Steelhead

- How much loss has occurred in the past week?**
No loss of juvenile CCV steelhead has occurred in the past week at the CVP or SWP fish salvage facilities.
- What is the distribution of fish within the Delta?**
On 10/20/2020 SaMT estimated 0-1% of juvenile CCV steelhead were present in the Delta.
- What is the exposure to CCV steelhead due to DCC gate closure?**
No juvenile Central Valley steelhead have been observed near the DCC gates in regional monitoring efforts and historical monitoring data does not detect steelhead in the Delta at this time. However, SaMT estimated that 0-1% of the population of CCV steelhead may be present in the Delta at this time. Closure of the DCC gates would reduce exposure and possible entrainment of juvenile CCV steelhead into the interior Delta via the DCC gates.
- What are the effects to CCV steelhead due to DCC gate closure?**
It is unlikely juvenile Central Valley steelhead are present near the DCC gates. Closure of the gates would positively impact any present juvenile Central Valley steelhead.

Supporting Information regarding Exposure of CCV Steelhead

Central Valley steelhead distribution estimate for 10/20/2020

<u>Yet to Enter Delta</u>	<u>In Delta</u>	<u>Exited Delta past Chipps Island</u>
99-100%	0-1%	0%

Central Valley steelhead average percent of annual emigrating population (LAD) salvaged at Delta fish facilities by 10/1 between 2005 - 2019

<u>Salvaged at Delta Facilities</u>
0.3%

See “Additional supporting information found in winter-run Chinook salmon” (section 3.b).

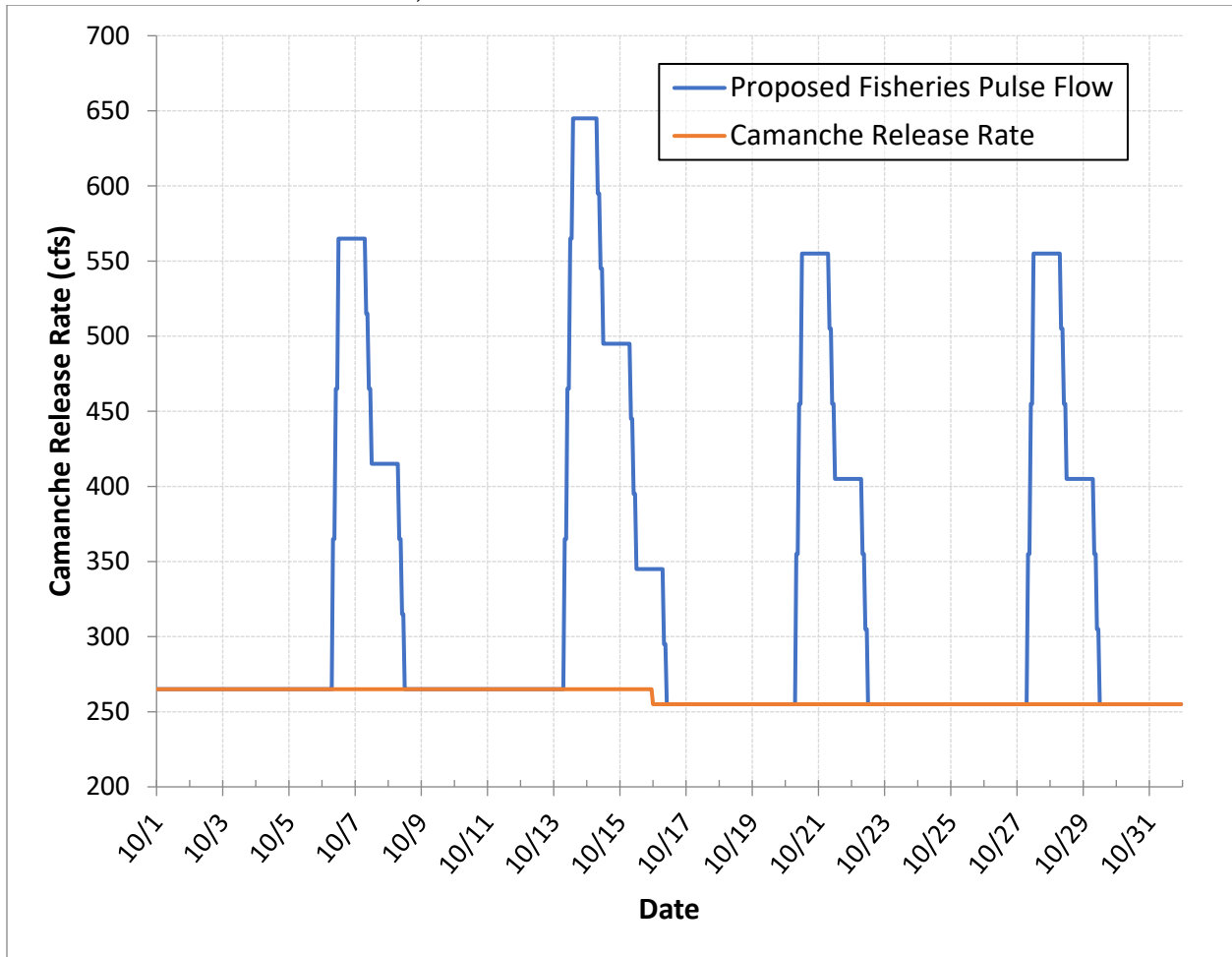
Supporting Information regarding DCC Management Effects on Central Valley steelhead

See additional supporting information found in winter-run Chinook salmon (section 3.b).

Attachment A.

Mokelumne River Pulse Flow Plan

Figure A1. October 2020 Mokelumne River Pulse Flow plan (source: 2020 DRAFT – Camanche Pulse Flows Scenario_4 Pulse_PCC_modelb)



Final Assessment
10/20/2020

Table A1. Alternative considered, October 2020 Mokelumne River Pulse Flows (source: 2020 DRAFT – Camanche Pulse Flows Scenario_4 Pulse_PCC_modelb)

Date	JSA Minimum Release (cfs)	INPUT - Base Flow - JSA Min + Buffer (cfs)	Add. Pulse Flow (cfs)	Total Release (cfs)	Daily Release Volume (AF)	DCC Gate Position
10/1/2020	250	265	0	265	526	Open
10/2/2020	250	265	0	265	526	Open
10/3/2020	250	265	0	265	526	Open
10/4/2020	250	265	0	265	526	Open
10/5/2020	250	265	0	265	526	Open
10/6/2020	250	265	175	440	873	Open
10/7/2020	250	265	213	478	947	Open
10/8/2020	250	265	63	328	650	Open
10/9/1010	250	265	0	265	526	Open
10/10/2020	250	265	0	265	526	Open
10/11/2020	250	265	0	265	526	Open
10/12/2020	250	265	208	473	939	Open
10/13/2020	250	265	293	558	1,106	<i>Closed at 1600</i>
10/14/2020	250	265	143	408	808	<i>Closed</i>
10/15/2020	250	265	33	288	572	<i>Closed</i>
10/16/2020	250	255	33	288	572	<i>Closed</i>
10/17/2020	250	255	0	255	506	Open at 1000
10/18/2020	250	255	0	255	506	Open
10/19/2020	250	255	175	430	853	Open
10/20/2020	250	255	213	468	927	<i>Closed</i>
10/21/2020	250	255	63	318	630	<i>Closed</i>
10/22/2020	250	255	63	318	630	<i>Closed</i>

Final Assessment
 10/20/2020

Date	JSA Minimum Release (cfs)	INPUT - Base Flow - JSA Min + Buffer (cfs)	Add. Pulse Flow (cfs)	Total Release (cfs)	Daily Release Volume (AF)	DCC Gate Position
10/23/2020	250	255	0	255	506	<i>Closed</i>
10/24/2020	250	255	0	255	506	Open
10/25/2020	250	255	0	255	506	Open
10/26/2020	250	255	0	255	506	Open
10/27/2020	250	255	175	430	853	Open
10/28/2020	250	255	213	468	927	Open
10/29/2020	250	255	63	318	630	Open
10/30/2020	250	255	0	255	506	Open
10/31/2020	250	255	0	255	506	Open

Attachment B

10/13/2020 Water Quality Modeling Results

Alternatives include a base case assuming no closure and an alternative assuming the closures described below:

- Closed at 1600 on October 20 and Open at 1000 on October 24
- Generally concurrent with second pulse flow planned for the Mokelumne River.

Hydrology assumptions:

- 1. San Joaquin River flow at Vernalis is at 780 cfs at the beginning of the forecast period and is estimated to increase to 1320 cfs by the end of the forecast period.
- 2. Sacramento River flow at Freeport is at 8252 cfs at the beginning of the forecast period and is expected to decrease to 8150 cfs by the end of the forecast period.
- 3. CCFB inflow is at 700 cfs at the beginning of the forecast period and is expected to decrease to 300 cfs by the end of the forecast period.
- 4. Export at Jones Pumping Plant is at 3400 cfs at the beginning of the forecast period and is expected to stay the same by the end forecast period.

Conclusion:

Model results indicate that no water quality concern level targets were exceeded. DCC gates should be closed during time period described above.

Figure B1. Water quality modeling at Jersey Point conducted on 10/13/20. Neither modelled alternatives (DCC gates open versus closed) indicate an exceedance of the electrical conductivity standard of 1800 umhos/cm.

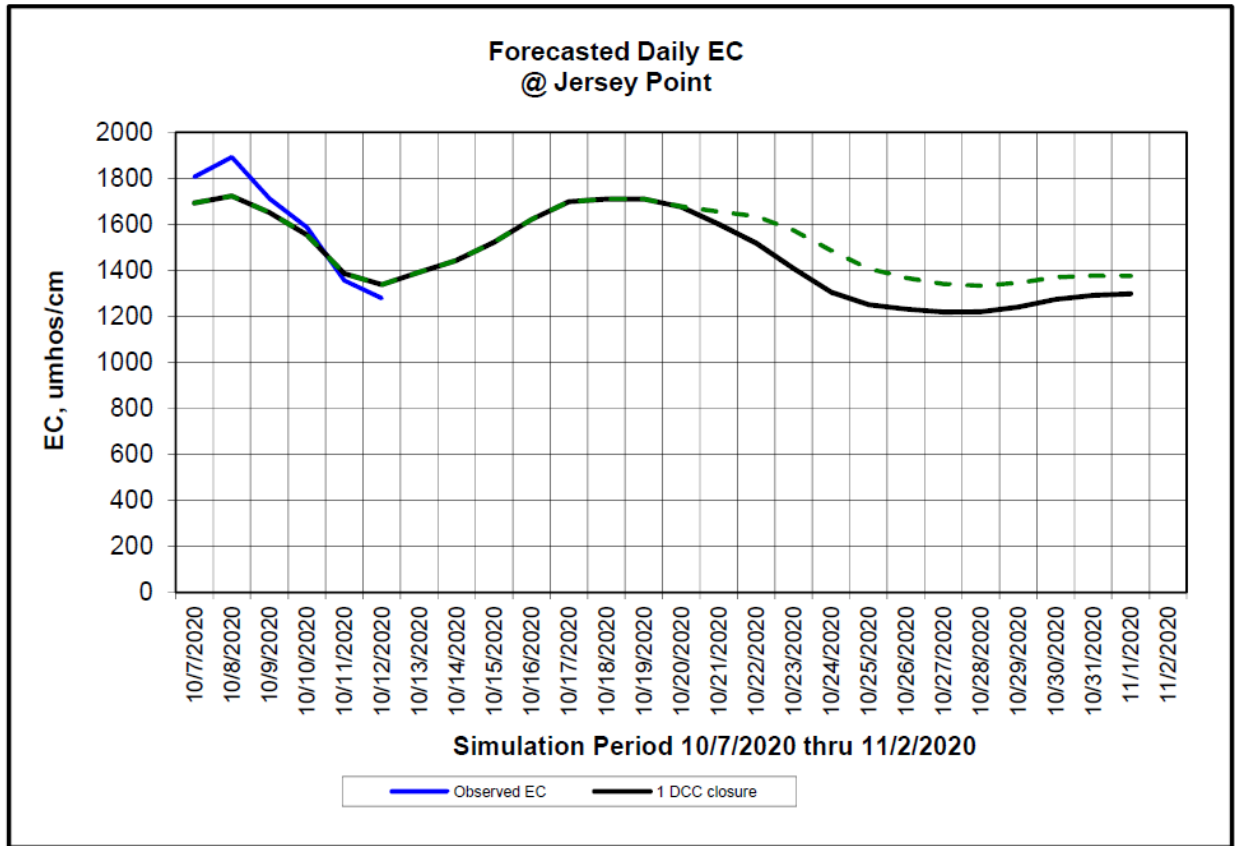


Figure B2. Water quality modeling Bethel Island conducted on 10/13/20. Neither modelled alternatives (DCC gates open versus closed) indicate an exceedance of the electrical conductivity standard of 1000 umhos/cm.

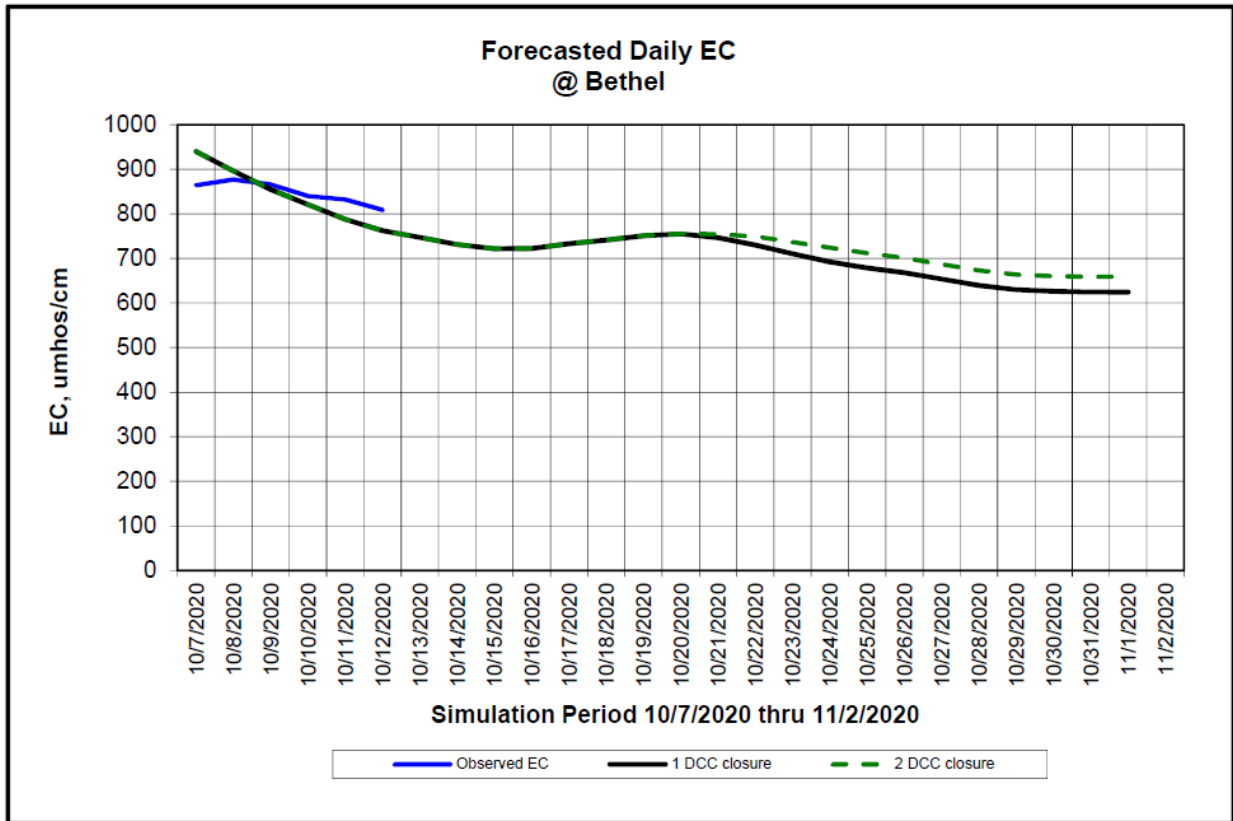


Figure B3. Water quality modeling at Holland Cut conducted on 10/13/20. Neither modelled alternatives (DCC gates open versus closed) indicate an exceedance of the electrical conductivity standard of 800 umhos/cm.

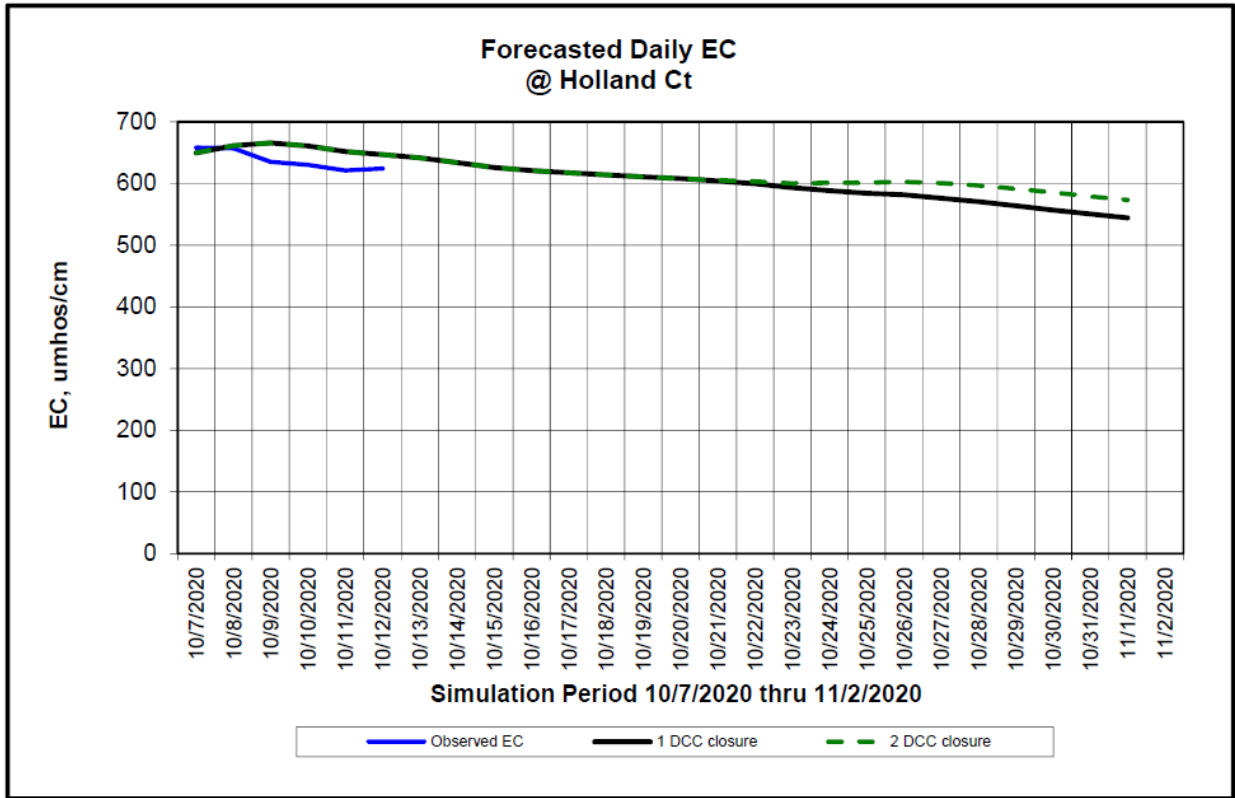


Figure B4. Water quality modeling at Bacon Island conducted on 10/13/20. Neither modelled alternatives (DCC gates open versus closed) indicate an exceedance of the electrical conductivity standard of 700 umhos/cm.

