Paradise Cut Discussion

Background

DWR has documented that tidal sloughs, including Paradise Cut, accumulate salts when there is little to no water flow into Paradise Cut from the San Joaquin River. Additionally, it is thought that inadequate tidal mixing of the higher salinity water prevents transport of that high salinity water downstream. Observed data from periods when water was flowing from the San Joaquin River into Paradise Cut shows major reductions in the salinity of water within Paradise Cut.

Previous transect and ion observations show conflicting results on whether elevated salinity in Paradise Cut can contribute to the high level of salinity observed on the Old River (South Old River Salinity Transect Study, 2012; Ion Report, 2021). Moreover, it is unclear the condition under which salinity in Paradise Cut may influence the entire Southern Delta system. DWR and USBR, in coordination with stakeholders and the Water Board, are planning a Paradise Cut flushing experiment. Conducting the PCFS provides an opportunity to further understand and potentially characterize the spatial temporal distribution and associated dynamics of water level, flow, and salinity conditions in and around Paradise Cut.

Historical data analysis

DWR owns and maintains two water quality monitoring stations within Paradise Cut. One station is located near mouth of Paradise Cut (PDC) and the other station is about four miles upstream of the confluence of Paradise Cut (PDUP). Refer to the map on Page 5 for reference. Data collected during the 2017 flood event was analyzed at these stations to observe Paradise Cut's response. The figures below show a dramatic drop in Specific Conductivity (SpCond) once flow began to overtop Paradise Cut weir during the high flow event in 2017 (Figures 1 and 2).
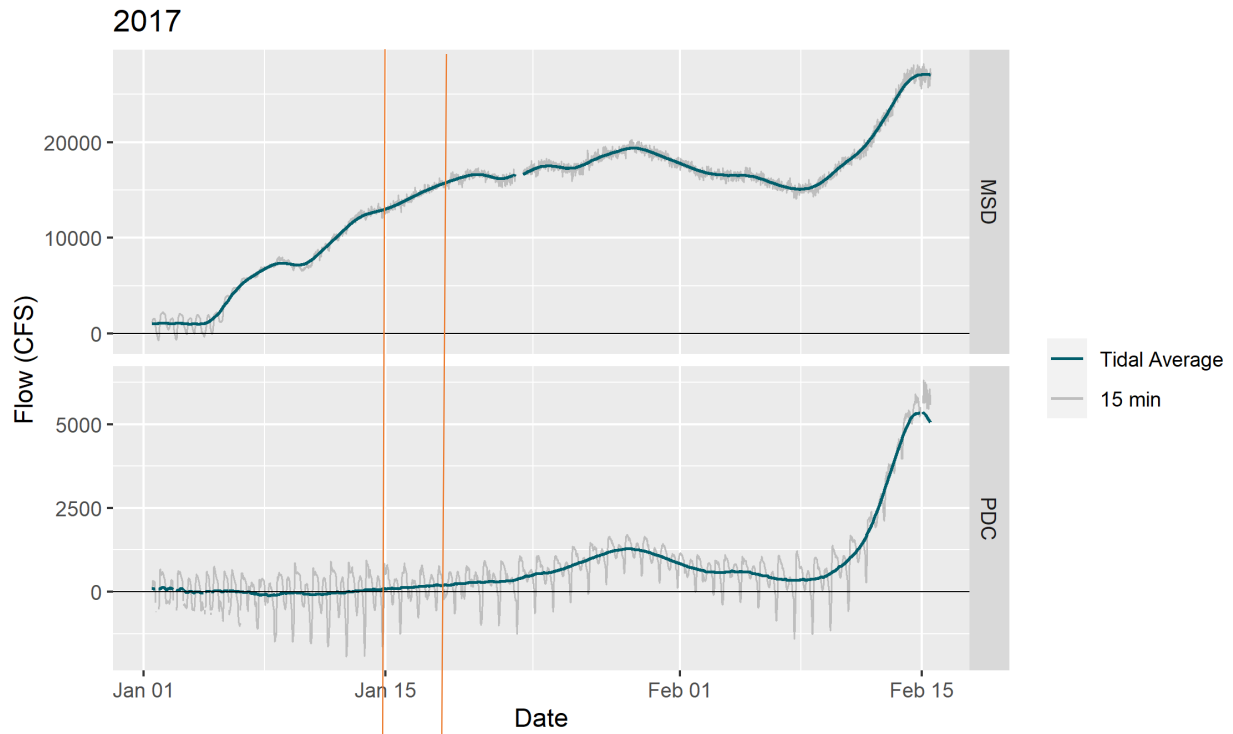
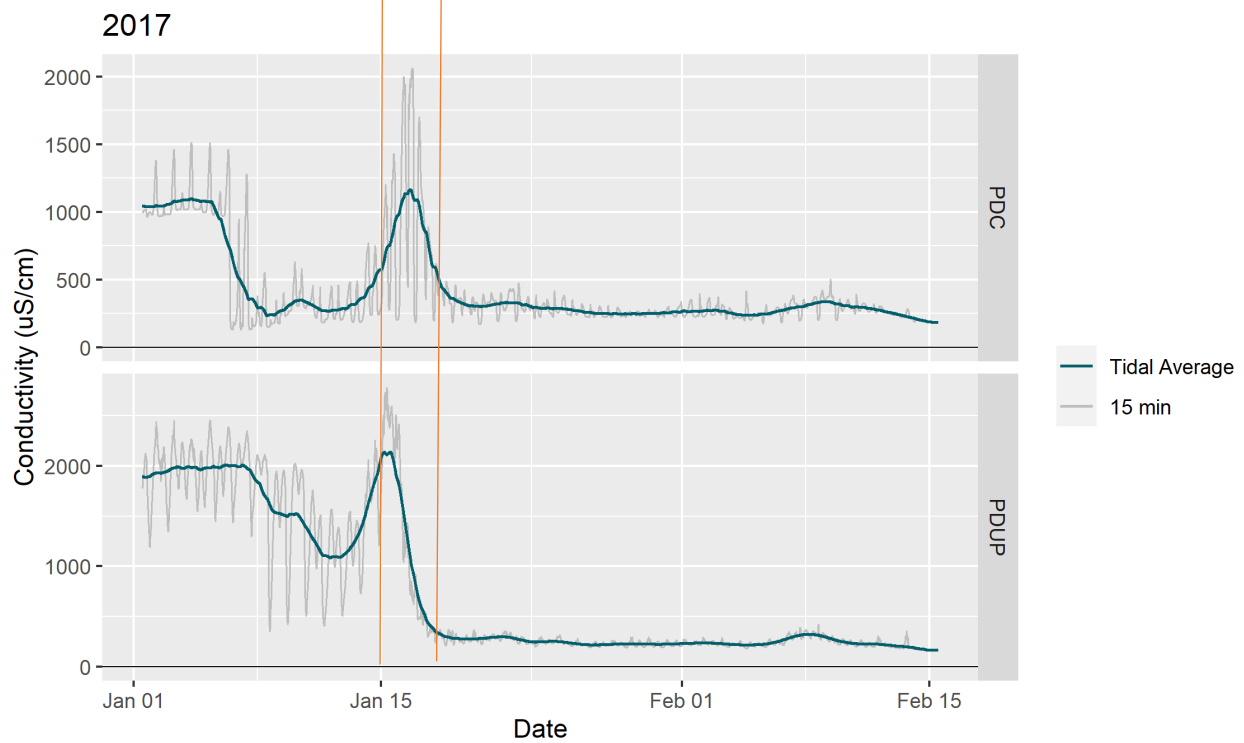Figure 1- Weir appears to have overtopped in January 2017.

Figure 2 - A spike in Conductivity may indicate the initial flush of salts were transported from upstream.

After the flushing event concluded (Figure 3), a quick rebound in SpCond was observed (Figure 4). In July, SpCond at PDUP increased from 180 uS/cm to 1130 us/cm within 14 days (6/30/2017 to 7/13/2017), an increased of about 60 – 70 uS/cm per day.
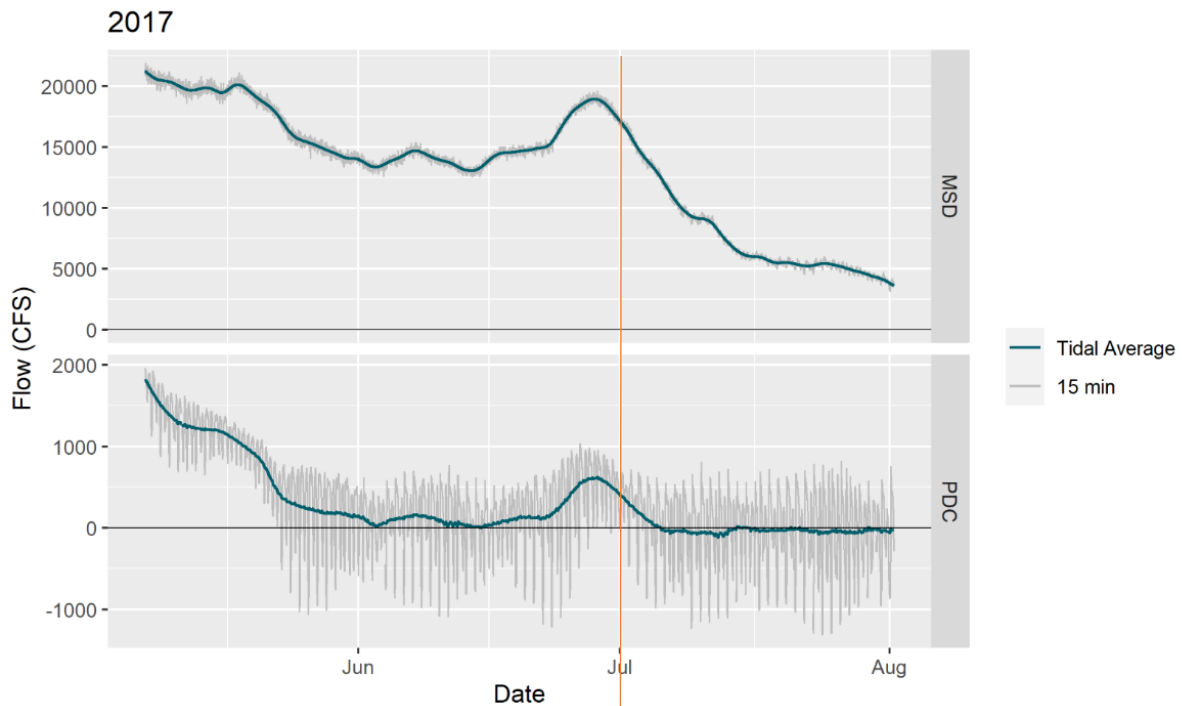

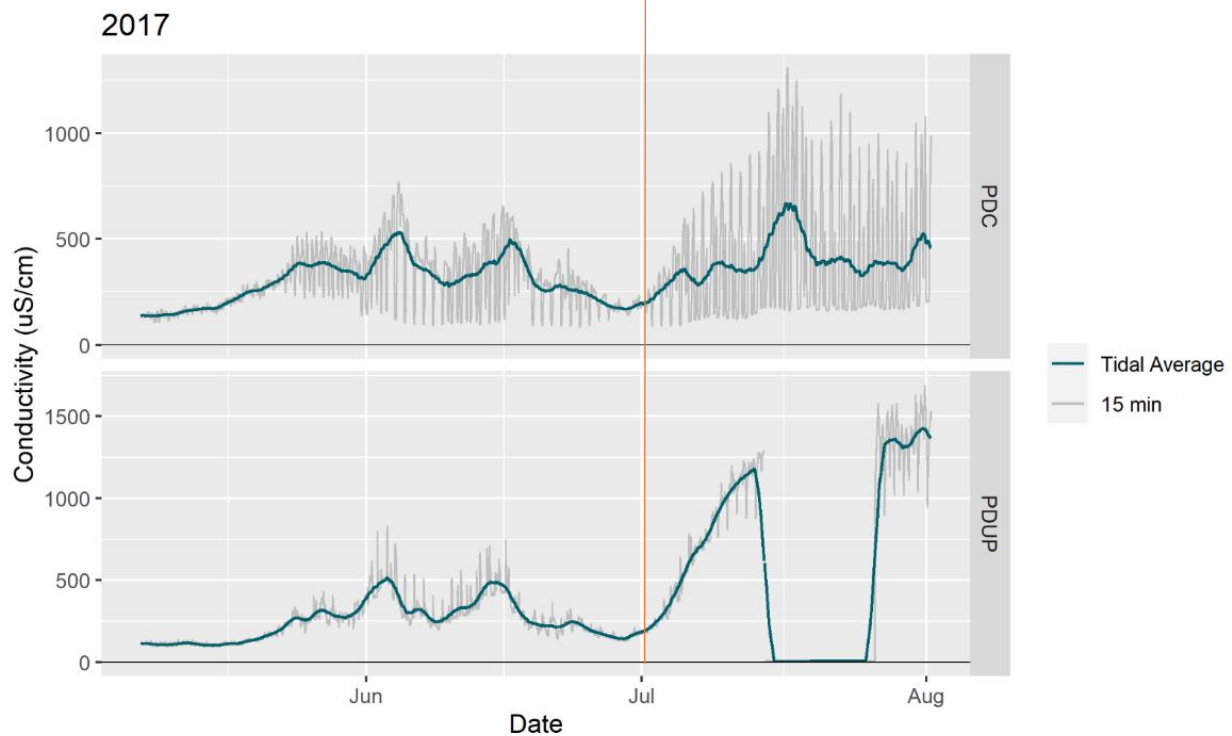*Figure 3- Flow rate in Paradise Cut dissipates leading into July 2017.*

Figure 4: Conductivity rebounds after flow dissipates. (note: drop in SpCond at PDUP in July is missing data)

In addition to analyzing Paradise Cut, staff are analyzing whether salinity within Paradise Cut can contribute to elevated salinity and compliance concerns downstream in Lower Old River.

Hypotheses

Elevated salinity levels in Paradise Cut can be reduced by flushing the slough using diversions from the San Joaquin River over Paradise Weir and reduce salinity levels near the Old River at Tracy Boulevard compliance station.

Tasks

- Task 1: Background analysis
- Task 2: Paradise Cut Survey
- Task 3: Permitting
- Task 4: Pre monitoring of Paradise Cut
- Task 5: Identifying Flushing Schedule and Constraints
- Task 6: Flush Paradise Cut
- Task 7: Post Flush monitoring
- Task 8: Analysis and Report

Schedule

Milestone	Estimated Date
Paradise Cut Flushing Study subgroup formed	3/4/2021
Draft Study Plan for stakeholders and Water Board's review.	5/1/2021
Finalize Study Plan in consideration of feedback.	8/1/2021
Develop Initial flushing flow schedule.	12/1/2021
Finalize flushing flow schedule.	4/1/2022
Start adding water to Paradise Cut.*	7/1/2022
Complete data collection.	8/1/2022
Draft report for stakeholders and Water Board's review.	11/1/2022
Finalize report.	1/1/2023

* Flushing of Paradise Cut will likely not occur in 2022 if conditions remain dry.

General Discussion and Study Questions

Study questions will be discussed during meeting.