Wastewater Effluent Discharge Assessment – Impact to Marine Organisms

UPDATE ON PROJECT STATUS

5 AUGUST 2021

Scope of Project

To determine whether exposure to Wastewater Treatment Plant effluent discharged into Puget Sound may cause adverse impacts to Puget Sound marine organism, particularly those that Southern Resident Killer Whales depend on for prey (Chinook Salmon).

Project Contract Staff

Position	Personnel	Organization
Project Manager	Jenifer McIntyre	Washington State University – Puyallup
Project Toxicologist	James Meador	NOAA Northwest Fisheries Science Center
Field Lead	Andy James	University of Washington – Center for Urban Waters
Data Management Lead	Jenifer McIntyre	Washington State University – Puyallup
Quality Assurance Lead	James Meador	NOAA Northwest Fisheries Science Center
Analytical Lead	Andy James	University of Washington – Center for Urban Waters
MS Student	Suz Ball	Washington State University – Puyallup

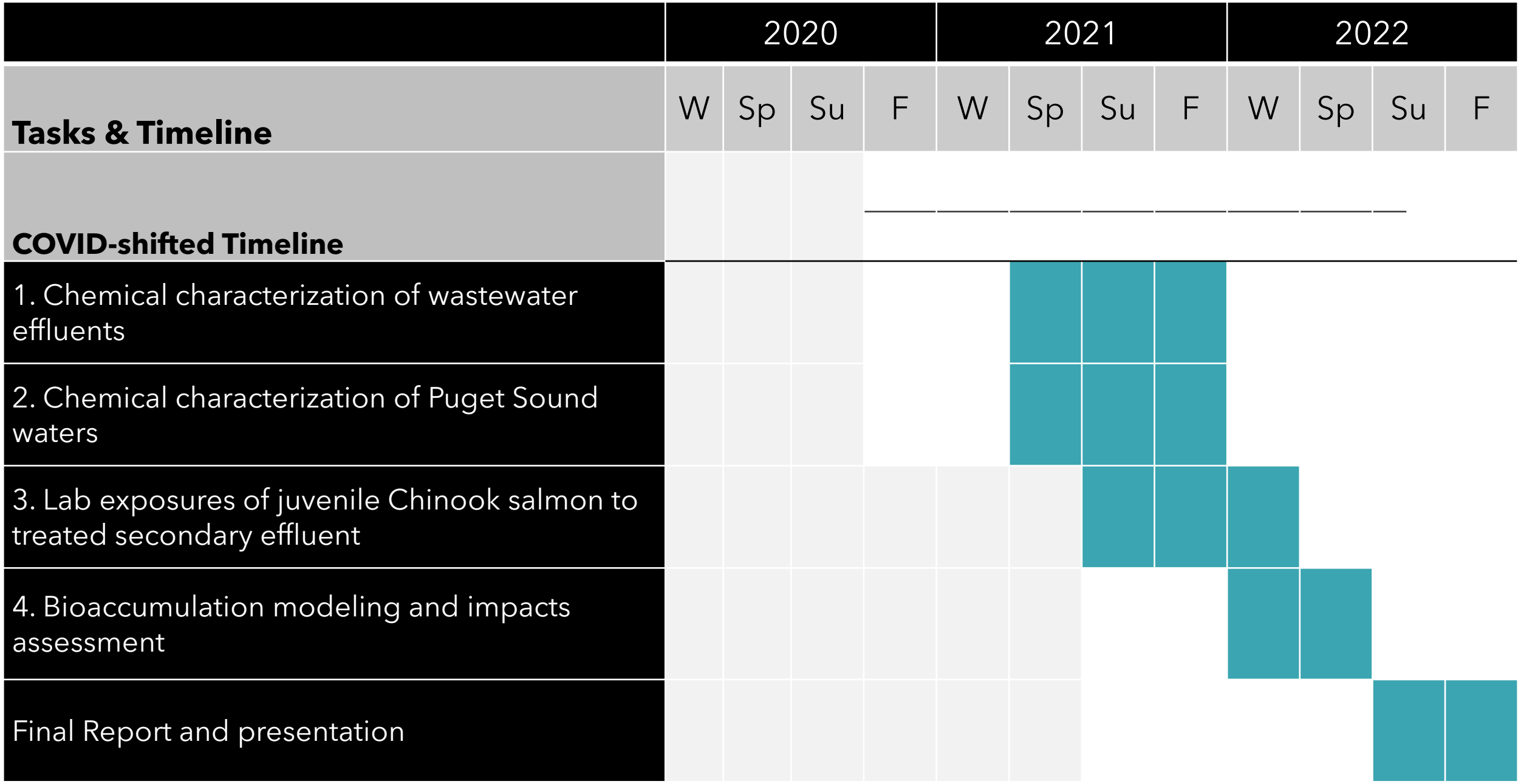
Goals and Objectives

The goal of this project is to explore the occurrence and biological impacts of chemicals of emerging concern (CECs) and other important contaminants from King County WWTP effluents entering Puget Sound

Objective 1: Provide baseline information on concentrations of these chemicals in effluent and Puget Sound waters nearby outfalls thereby reducing uncertainty assessing their biological impacts in the Puget Sound.

Objective 2: Use quantifiable biological indicators of toxic effects to characterize responses of juvenile chinook to effluent.

Objective 3: Determine bioaccumulation potential for contaminants in effluent that can be used to evaluate potential risk. Such data can also provide a framework for improvement of vital signs and biological targets.


2020
2021
2022
Tasks & Timeline
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COVID-shifted Timeline
1. Chemical characterization of wastewater effluents
2. Chemical characterization of Puget Sound waters
3. Lab exposures of juvenile Chinook salmon to treated secondary effluent
4. Bioaccumulation modeling and impacts assessment
Final Report and presentation

PROJECT TASKS

Chemical characterization of effluent from wastewater treatment plants (WWTP) during ‘high flow’ and ‘low flow’

- The objective of this task is to characterize the influence of stormwater runoff on wastewater effluent quality for three King County wastewater treatment facilities: South Plant (SP), West Point (WP), and Brightwater (BW).
- Task is on Track: All samples have been collected and sent to the laboratory for analysis.

Laboratory exposures of juvenile Chinook salmon (low flow, South Plant)

- The project team will conduct a set of short-term exposure experiments consisting of a dilution series of whole effluent to juvenile chinook.
- Task is on Track: Experiments are being conducted at the Washington State University Stormwater Center in Puyallup, WA.

Chemical characterization of estuarine waters near WWTP outfalls during ‘low flow’

- The project team will conduct sampling of marine waters near Wastewater Treatment Plant outfalls in Puget Sound to quantify contaminants
- Task is on Track: All samples have been collected and sent to the laboratory for analysis.

Bioaccumulation modeling and impacts assessment

- From the data received from the chemical characterization assessments and lab studies, WSU will model bioaccumulation of contaminants contributed from wastewater effluent.
- Task Will Start Once the Chemical and Laboratory Testing is Completed.

Project milestones completed as of August 2021

- High Flow Sampling completed in March 2021 at WPTP, South Treatment and Brightwater
- Juvenile Chinook lab study started in May 2021
- Low Flow Sampling completed in June 2021

Overall project summary as of August 2021

- All samples have been collected and sent to the laboratories for testing
- Bioaccumulation modeling will start soon
- Project is on track for completion in 2022