

2025 CAERNARVON FRESHWATER DIVERSION OPERATIONS PLAN

Salinity monitoring within the Breton Sound Basin has indicated a freshening trend as a result of increased Mississippi River discharge through passes on the east bank of the river. In response to this change, the Caernarvon Technical Working Group has proposed a modified Caernarvon Freshwater Diversion (BS-0008) operations plan to implement on a trial basis for 2025. This plan incorporates a monthly salinity range to guide diversion operations that is based on salinity tolerances for the eastern oyster (*Crassostrea virginica*) during different stages of its lifecycle (Figure 1). A salinity range for the eastern oyster is being used to guide operations, in part due to the species being sessile (except during its larval stage), and therefore unable to relocate to areas of optimal salinity. At the request of the Coastal Protection and Restoration Authority (CPRA), the Louisiana Department of Wildlife and Fisheries (LDWF) provided the oyster salinity range, taking into consideration the need for continued operations of the Caernarvon Freshwater Diversion to meet project goals. With adoption of this salinity range, diversion operations will no longer be based on the 10-year mean monthly salinity for the gage in use, as has been the procedure since 2020.

The CPRA will operate the Caernarvon Freshwater Diversion based on a 14-day salinity moving average calculated on salinity measured at the real-time US Geologic Survey (USGS) Black Bay nr Snake Island nr Pointe-A-La-Hache, LA-07374526 (Snake Island) gage (Figure 2). Operations will be based on salinity at this mid-basin gage year-round. Previous operations plans incorporated two gages, one in the northern basin (5 ppt isohaline) and one in the southern basin (15 ppt isohaline), which were used during different times of the year. The USGS Black Bay nr Stone Island nr Pointe-A-La-Hache, LA-073745275 (Stone Island) real-time gage will be used as an alternate gage to guide diversion operations if the Snake Island gage is damaged or malfunctions (Figure 2).

Previous operations plans used two additional USGS real-time gages to guide diversion operations: Crooked B. NW of L. Cuatro Caballo near Delacroix-073745257 (Crooked Bayou, primary gage for 5 ppt isohaline), and Northeast Bay Gardene near Pointe-A-La-Hache, LA-07374527 (Bay Gardene, reference gage for 5 ppt isohaline) (Figure 2). Salinity at both of these gages, in addition to the Stone Island gage, will continue to be monitored and any discernable impacts to salinity at these gages in response to this modified plan will be noted. Additionally, the 5 ppt and 15 ppt isohalines will remain as part of the plan for a similar purpose, as these targets were originally established to ensure the range of salinities necessary for a functioning estuary.

Diversion discharge above a baseflow of 500 cubic feet per second (cfs) will be limited to times when the 14-day salinity moving average at the Snake Island gage is above the lower limit of the salinity range. When the 14-day salinity moving average is below the lower limit of the salinity range, the diversion will be operated at a baseflow of 500 cfs. The CPRA will implement a cautionary 2 ppt salinity buffer above the minimum salinity of the range to curtail pulsing operations when the 14-day salinity moving average is on a downwards trajectory. When the 14-day salinity moving average rises above the lower limit of the salinity range, the 2 ppt buffer will be used to prevent reactionary diversion operations. Increased flow (pulsing) won't occur until salinity rises above the 2 ppt buffer and indicates a continued upwards trajectory. Diversion discharge is not to exceed 8,000 cfs.

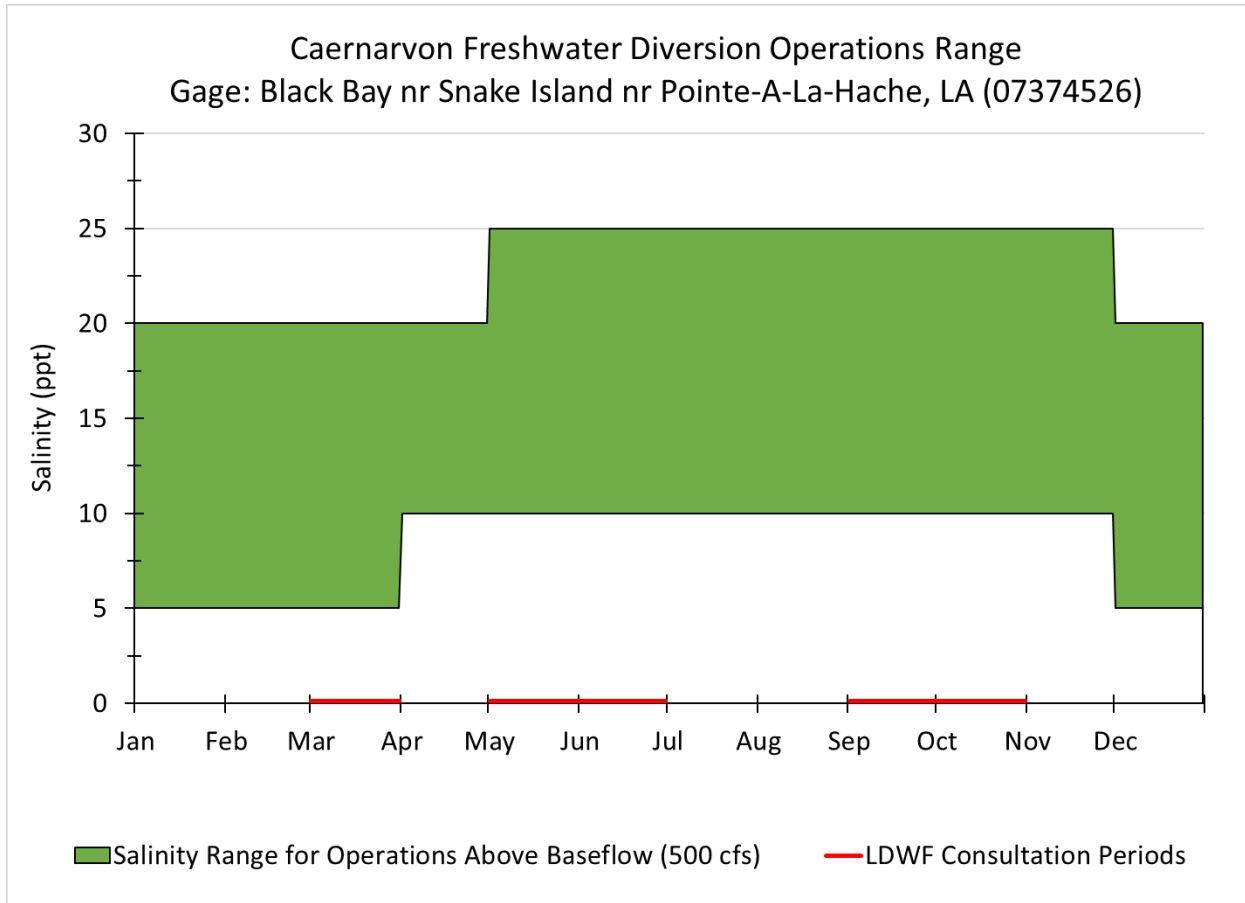


Figure 1. Salinity range at the USGS Snake Island gage within which the Caernarvon Freshwater Diversion may be operated above baseflow. The LDWF consultation periods are indicated on the timeline by bolded red lines.

Diversion discharge may deviate from the 2025 Caernarvon Freshwater Diversion Operations Plan as follows:

- Changes to diversion operations may be required in response to forecasts of local coastal flooding, chemical spills in the river, diversion maintenance, local emergency situations, and the potential for diversion backflow.
- The diversion may be operated above baseflow for public relations and/or educational purposes, though discharge is not to exceed 5,000 cfs for a duration of longer than two hours.
- The CPRA will coordinate diversion operations with the LDWF during brown shrimp and oyster recruitment and reproductive seasons (Figure 1). Consultation periods occur in March for brown shrimp and May through June and September through October for oysters.

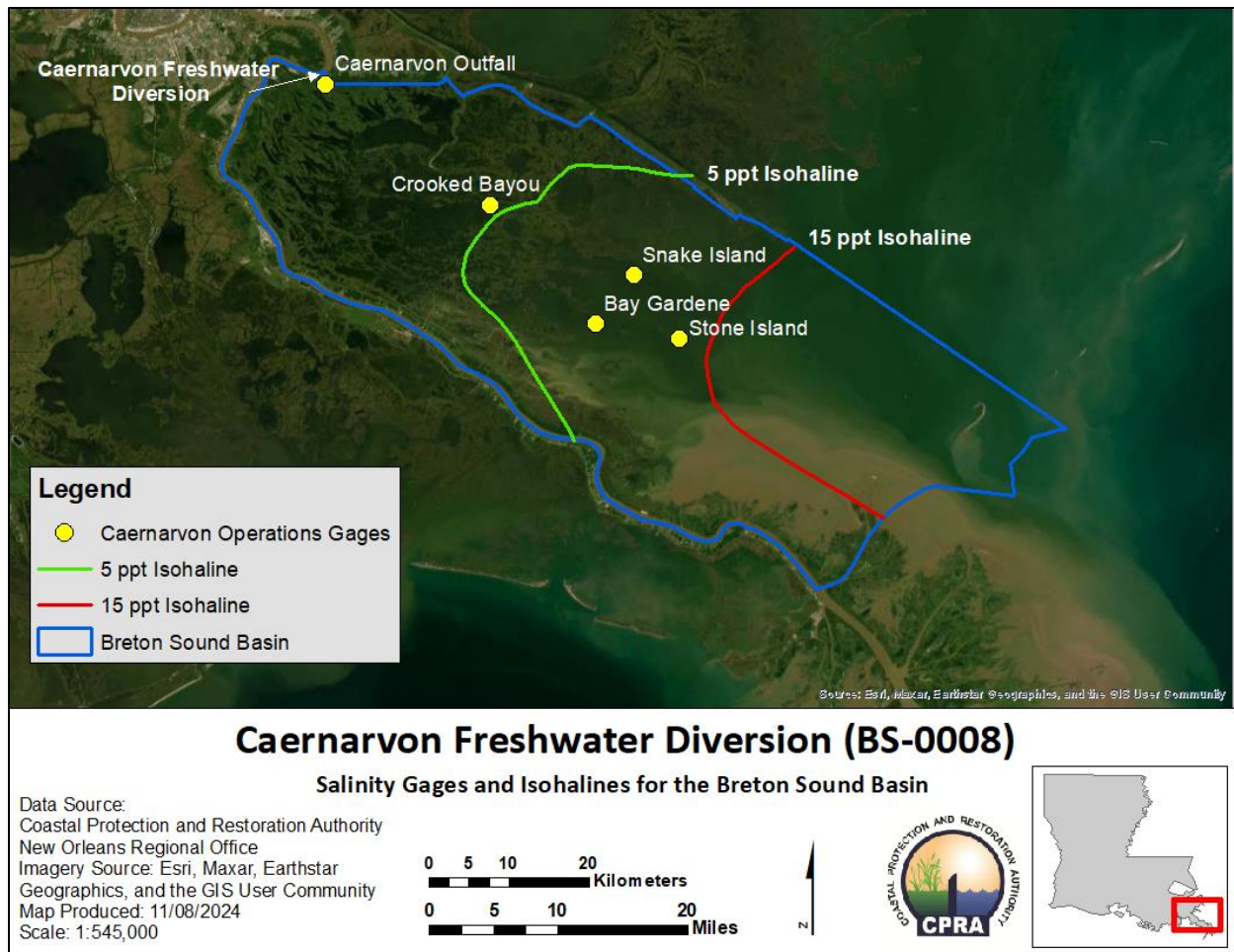


Figure 2. USGS real-time salinity gages in the Breton Sound Basin to be used for guidance and operation of the Caernarvon Freshwater Diversion. The Snake Island gage will be used year-round to guide diversion operations, while the Stone Island (alternate), Bay Gardene and Crooked Bayou gages will serve as reference gages. The 5 ppt (Crooked Island gage) and 15 ppt (Stone Island gage) isohalines will continue to be used for comparison to the measured basin salinity.