

THERMAL GUIDELINES IN MANATEE-ACCESSIBLE WATERS

AQUIFER STORAGE AND RECOVERY (ASR)

Implement the following during the winter season, typically between November 1 to March 31,:

1. ASR discharge water temperatures shall be monitored at both the discharge point and at selected sites in the receiving waters on a daily basis until the effect of the discharge has been determined.
2. Intermittent ASR discharges that increase receiving water ambient temperature above 20°C may create unreliable warm-water refugia, which will not sustain manatees through cold periods. These types of discharges should be modified to either:
 - Impound or store water to decrease temperatures equal to or below ambient water temperature prior to discharge, or
 - Diffuse or mix ASR waters to dilute temperature effects so no temperature increase occurs in ambient waters, or
 - Ensure that ASR water released into ambient waters is a minimum of 20°C prior to discharge, and that the volume of flow is continuous and sufficient to provide warm-water refugia that will be biologically meaningful to manatees.

REDISTRIBUTION OF FRESHWATER FLOWS (WARM WATER REFUGES)

Agencies implementing CERP projects should monitor and adaptively manage the effects of freshwater flow redistribution on manatees. Among these effects are anticipated shifts in manatee distribution, movement patterns, and foraging areas. Manatees are known to be adversely affected from prolonged exposure to water temperatures below 20°C. Therefore, CERP-related changes that may affect manatee winter-use patterns deserve close attention.

A large number of manatees over-winter at passive thermal refuges within the CERP project areas. These locations provide slightly warmer waters where manatees aggregate during winter cold spells. Of particular interest are changes in physical characteristics of these sites due to CERP projects that affect changes in water flows.

Documented manatee warm-water refuges within CERP project areas shall be assessed for anticipated changes prior to construction activities. The Task Force and associated agencies may provide guidance and recommendations on preconstruction actions to minimize detrimental effects.

The Task Force and associated agencies will assist with developing protocols to avoid/minimize adverse effects to manatees during CERP construction activities.

Sites identified as likely to be affected by the redistribution of freshwater flows shall be monitored for fluctuations in water temperature and manatee use.

If water temperatures in documented refugia are lowered below 20°C due to the introduction of CERP redistributed flows, alternative technologies (e.g., solar arrays) shall be employed to sufficiently warm the water above 20°C in order to protect any affected refugia.