

UNUSUAL THERMOCLINES



About Unusual Thermoclines

A thermocline is a transition layer between warmer ocean waters at the surface and cooler, deep water. As warmer water is less dense than cooler water, it rises to the surface and will stratify, or separate, into layers according to density. A thermocline can be easily recognized by a sudden change in temperature or a blurry layer toward the surface of the water, which denotes the boundary between the different water densities (Figure 1). Thermoclines vary and shift during seasons, often moving deeper in the summer months due to an increase in warmer water near the surface.

Causes of Unusual Thermoclines

Thermoclines occur naturally and are not considered marine incidents, however, the Southeast Florida Action Network (SEAFAN) does seek reports of unusual thermoclines, such as a thermocline that persists in one specific location, upwelling of cooler water in a shallow spot, a reverse thermocline (cooler on top, warmer below) or warmer discharged water. SEAFAN seeks these reports, as an unusual thermocline can be a sign of change in discharge from water management regimes. Alterations in discharged water from canals, lakes or reservoirs into the ocean can cause unnatural shifts in salinity and thermal stress, which can reduce water's carrying capacity for dissolved oxygen and other parameters.

FAST FACTS

Negative biological impacts from unusual thermoclines include:

- » Coral stress, as coral is particularly sensitive to changes in temperature and salinity.
- » Affected fish schooling, breeding and feeding locations due to changes in the thermocline's location in the water column.
- » Changes in the ecological community structure of marine plants due to shifts in salinity.

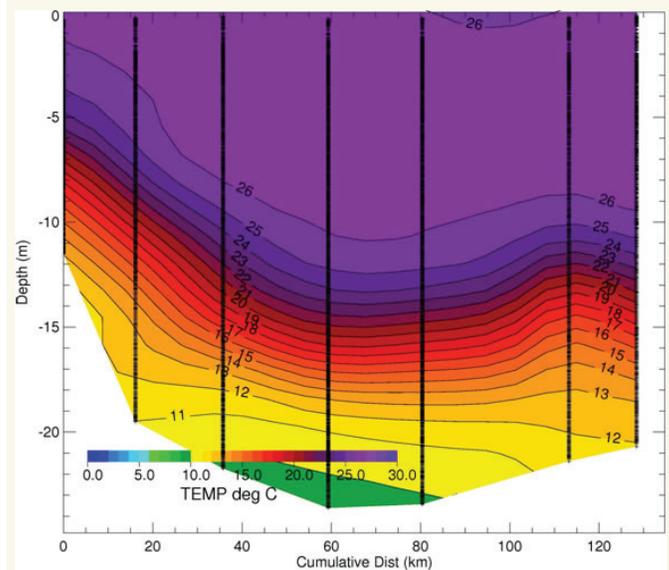


Figure 1. A vertical cross section of a water basin's temperature gradient that shows warmer waters at the surface and cooler waters below. Image: NOAA GLERL

Report unusual thermoclines to Southeast Florida Action Network (SEAFAN) [online](#) or call 866-770-7335



SEAFAN is a reporting and response system designed to improve the protection and management of Southeast Florida's coral reefs by enhancing marine debris clean-up efforts, increasing response to vessel groundings and anchor damage, and providing early detection of potentially harmful biological disturbances.