

Understanding Thermoclines

Finding Summer Trout in New Zealand Lakes



As summer settles in and lake temperatures rise, many lake-based anglers notice that trout seem to disappear. Areas that produced fish throughout spring suddenly become quiet, and long hours of trolling or casting can yield little success. The reason is often a naturally occurring phenomenon known as the thermocline.

Understanding how thermoclines form, how they influence trout behaviour, and how to identify them with a fish finder can greatly improve your success during the warmer months.

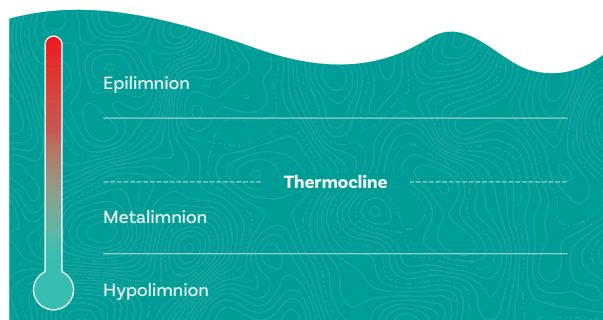
What is a thermocline?

A thermocline is a distinct layer within a lake where water temperature changes rapidly over a relatively short depth. During spring and early summer, increasing air temperatures warm the surface water. As warm water is less dense than cold water, it remains on top, while the colder, heavier water stays near the lakebed.

This creates three distinct layers:

- **The epilimnion** – the warm, well-mixed surface layer
- **The thermocline (or metalimnion)** – the transition zone where temperature drops rapidly
- **The hypolimnion** – the cold, deep water beneath the thermocline

In many of New Zealand's deeper lakes, particularly in the North Island, the thermocline develops by early summer and remains until cooler autumn weather allows the lake to mix again.



Why trout follow the thermocline

Brown and rainbow trout are cold-water fish that favour water temperatures between approximately 10°C and 16°C. During summer, surface temperatures can rise above 18–20°C, creating warmer water with lower dissolved oxygen levels that trout tend to avoid.

Trout cannot simply move to the deepest, coldest water, however, as feeding conditions may be poor. Instead, they often concentrate around the thermocline—the zone where water temperature changes rapidly with depth. This area can provide suitable temperatures and oxygen levels while also concentrating food such as smelt, bullies and aquatic invertebrates.

Rather than moving throughout the entire water column, trout spend much of the day following this zone. Once an angler identifies this depth, it can provide a useful starting point for locating trout and targeting them effectively.

How deep is the thermocline?

The thermocline depth varies considerably depending on the lake, weather conditions and time of year. In New Zealand lakes, thermoclines commonly develop between eight and 20 metres, although they may be shallower after prolonged calm weather or deeper in large, clear lakes.

Wind also plays an important role. Several days of strong wind can partially mix the upper water layers and temporarily weaken or deepen the thermocline. Calm, settled conditions generally produce the most defined temperature layers.

As the depth of the thermocline changes throughout the season, anglers should check for it every time they head onto the water.

Finding the thermocline with a fish finder

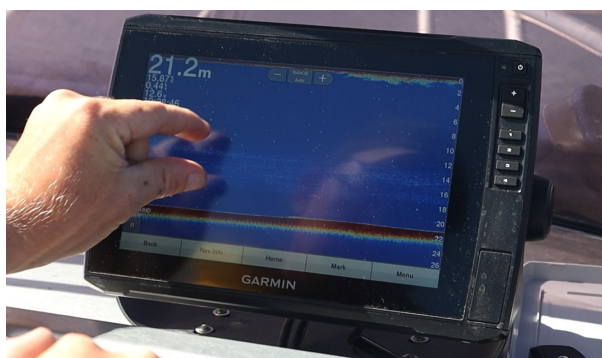
Modern fish finders make locating the thermocline surprisingly straightforward. On a quality sonar unit, the thermocline often appears as a faint but continuous horizontal band or line stretching across the screen. Depending on your colour palette and sensitivity settings, it may appear as a band of scattered returns rather than a solid line.

One of the easiest ways to identify the thermocline, is by looking for concentrations of baitfish. Schools of smelt frequently gather around the thermocline, and trout are rarely far away.

To improve your chances of seeing it:

- Set your sonar to manual or increase sensitivity slightly
- Use traditional CHIRP sonar rather than relying solely on DownScan or SideScan
- Travel over water deeper than the expected thermocline
- Watch for a consistent horizontal band appearing at the same depth across multiple passes
- Look for bait schools and trout arches sitting just above, within, or immediately below that layer

If your sounder includes a water temperature sensor, you can also lower a temperature probe through the water column to confirm where the rapid temperature change occurs, although most recreational anglers rely entirely on sonar.



Fishing the thermocline

Once you have located the thermocline, the goal is to keep your lure or fly at that exact depth. For trolling anglers, lead-core line, downriggers and diving lures are excellent tools for maintaining a consistent presentation. Downriggers provide the greatest accuracy, allowing anglers to target trout holding within a metre or two of the thermocline.

Those using lead-core line should first determine how much line is required to reach the desired depth at their trolling speed, then repeat that presentation consistently. Fly anglers fishing from boats can also target suspended trout using sinking lines or shooting heads counted down to the required depth before beginning a slow retrieve.

Seasonal changes

The thermocline is not permanent. As autumn arrives and cooler nights reduce surface temperatures, the upper layer begins to cool. Eventually, the entire lake reaches a similar temperature, allowing wind to mix the water from top to bottom in a process known as turnover. At this point, trout once again disperse throughout the lake and may regularly feed in shallow water, making them much easier to target from shore or small boats.

Understanding the lake

Learning to recognise the thermocline is one of the most valuable skills a lake angler can develop. Instead of searching blindly through tens of metres of water, you can focus your efforts where trout are most likely to be holding. By combining a good understanding of lake stratification with careful use of your fish finder, you will spend less time guessing and more time fishing productive water.