THE LAKE FACTOR
"WATER TEMPERATURES & CURRENTS"

A fisherman's ability to reliably control the speed & temperature at the lure is one of the key to catching great lakes fish. Those fisherman that are willing to use instruments like the Sub-Troll 900 will consistently out fish those using other fishing techniques.

Spring Temperature

Fishing for salmon in early spring (April & May) can be a challenge for even a seasoned angler. Most of the lake water is cold from top to bottom. The salmon spend the winter months in the deepest waters where the temperature does not fall below 39 degrees. As the warming rays of the sun raise the temperature of the water close shore, the salmon begin to migrate shoreward in search of warmer water (figure #1) and bait fish. Water temperature plays such an important part in fishing that every angler needs to pay attention and react to even subtle variances. Fish are no different than a lot of animals when it comes to heat and cold. They want to stay comfortable. Consequently, even a small change or "break" will cause fish to move from one location to another.

The Clean Water Act & Zebra Mussels has made the lakes a lot clearer than they were many years ago. This fact may keep the light sensitive salmon from coming as close to shore as in years past.

Wind direction will affect the surface temperature of the lake close to shore. If you have an offshore wind that remains steady for a period of time, the warmer water will be pushed out into the lake where it will disperse. This will lower the water temperature that is close to shore.

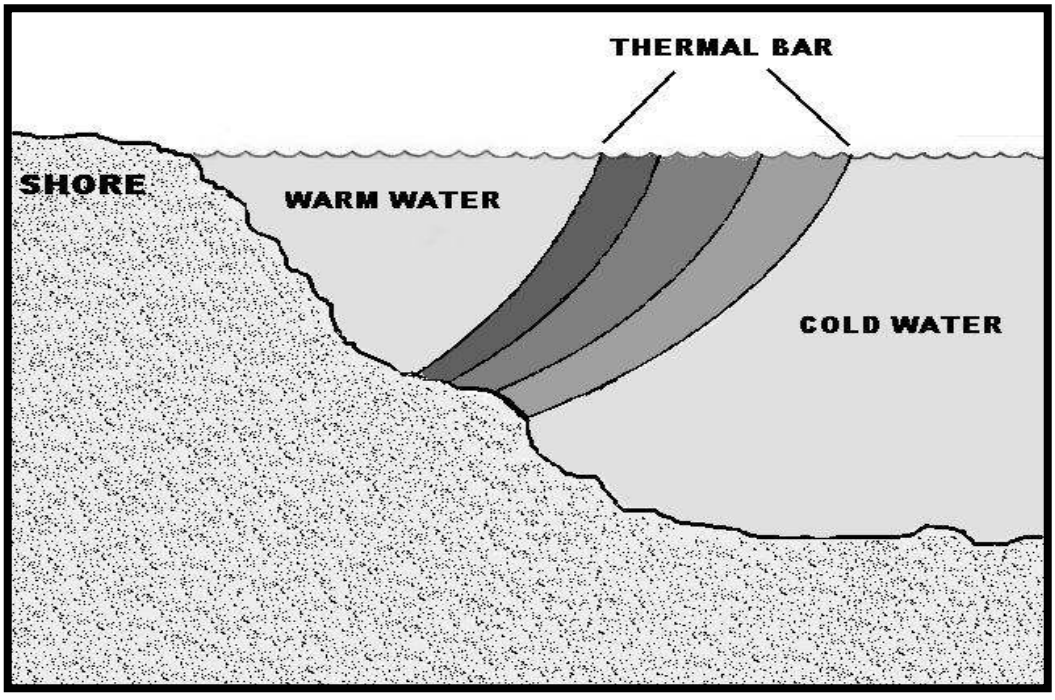

Figure #1 "Simplified Spring Water Temperature Profile

Most anglers know that salmon are relating to the warmth of the water and prefer a water temperature of around 55 degrees. In the spring the average water temperature of most lakes is around 35 to 45 degrees below the Epilimnion layer. The range of temperature of the top 20 feet (Epilmnion layer) is around 40 to 50 degrees F. (See figure #2). The thermal stratification of the lake begins in late April and early May of each year.

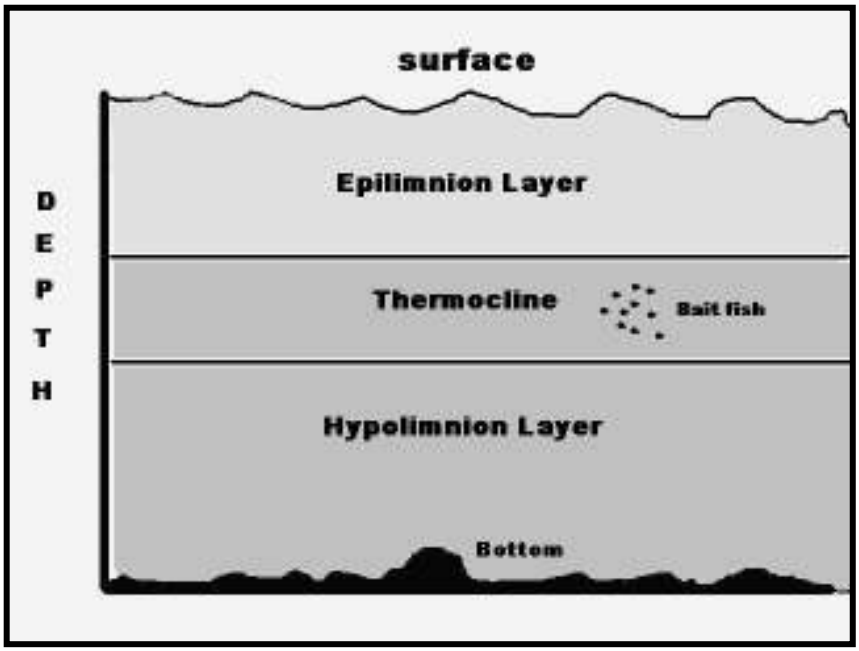

Figure # 2 Thermal Stratification

Figure # 2a Terms

The **epilimnion** is the top layer. Although there is plenty of dissolved oxygen in this layer due to its frequent contact with air, water temperatures are high in the summer. Warm-water fishes such as largemouth bass and crappie can inhabit this layer year round, but cool-water fishes such as salmon have to move to deeper water as the temperatures increase during the summer.

The **hypolimnion** is the bottom layer. This is the coolest layer and has the lowest amount of dissolved oxygen because it is not exposed to the air and all of the oxygen is used up during natural processes. Fish are not often found in this layer in the late summer and early fall.

The **thermocline**, or middle zone, is the most important zone to fishermen. It offers a wide range of temperatures, including those preferred by cool-water fish. The thermocline can produce good fishing; however factors such as cover and food sources also have an influence. The thermal stratification begins in late April and early May of each year.

In early spring concentrate on water depths of 40 feet or less. By May you should be in depths of 60 to 100 close to shore. Pay close attention to variations in water temperature. Both surface and mid-depth temperatures are critical to locating salmon and trout at this time of the year. Take Reading at the surface and then down 5, 10, 15 and 20 feet with the Sub-Troll 900. This will allow you to constantly monitor the temperature at any depth.

Summer Temperature

Once the summer Thermocline has set up, the lake will look a lot like figure #2 with the warmest waters close to shore. The cool depths of the lake offer a comfortable temperature and supply of food for most fish. They may be in depths of 40 to 120 ft deep so a good depth finder and the Sub-Troll probe is a must.

Much of the off-shore fishing is dictated more by the location of the thermocline than anything else. When fishing off-shore, most anglers try to fish just above or below the thermocline. You find that the temperature changes found in just a few feet of depth will be the difference between catching fish or not.

On the waters of the great lakes the temperature is in a constant state of change. The location of the thermocline is affected by the changes in the weather, wind condition and lake size. With a product like the Sub-Troll 900 you can find the exact temperature you're looking for 2 times faster than with our competitor's product and lock on to it.

LAKE CURRENTS and SPEED

For a long time it's been known that lure speed control plays a very important part in downrigger fishing. That's why all fishing lures have an effective speed range of operation. You hear the fisherman on the radio all the time, what's your speed, what lure are you using, how deep are you. Well, unless you're in the same location on the map, this most likely will not work for you. Many of us find a lure that will run hot in one direction, and then runs cold, no new hits. Why? This is because the lure is no longer operating within its effective speed range. If just one lure is not at the proper speed, it can affect ones that are at their effective speed. What's the cause of this variance? Underwater currents.

A lot of troller head to deep water and look for thermal bars, scum lines and baitfish. Once they find the thermal bar, they start to trolling in an "S" pattern though it. This pattern will cause the lures on the outside lines to speed up and the lures on the inside lines to slow down. This is a hit or miss method of controlling lure speed and wastes a lot of gas.

Moor Electronics has solved the problem, with the Sub-Troll 900 (ST-900). The ST-900 gives you speed & temperature where you need it most, at the lure. This system allows you to monitor the speed of the lure – not the speed of the boat. The Sub-Troll 900 is the only unit on the market that has a speed paddle wheel that was designed for slow speed applications. Our paddle wheel has 2 ½ times the surface area to reveal small variances in the currents. You know immediately if under water currents are affecting the lure's action.

Below are different types of current that you could see on the lake.

Trolling Currents

One of the first things you should do with any lure is check its effective speed or action. You want to check the lure action beside the boat to establish an effective speed. Run the Sub-Troll 900 just a few feet below the surface and set up a chart that show you what each lures effective speed is. As an example we have tested lure " X " and found its effective speed to be around 2.0 mph., lure " Y " effective speed is around 2.5 mph.

Lure " X " Effective Speed = 1.9 to 2.2 mph
Lure " Y " Effective Speed = 2.2 to 2.8 mph

In Figure # 3 the angler is trolling on a calm lake, no wave action or currents. The boat speed, GPS and Sub-Troll 900 are all the same. The lure he is using is in the correct speed zone, The lure (Lure X) action is correct.

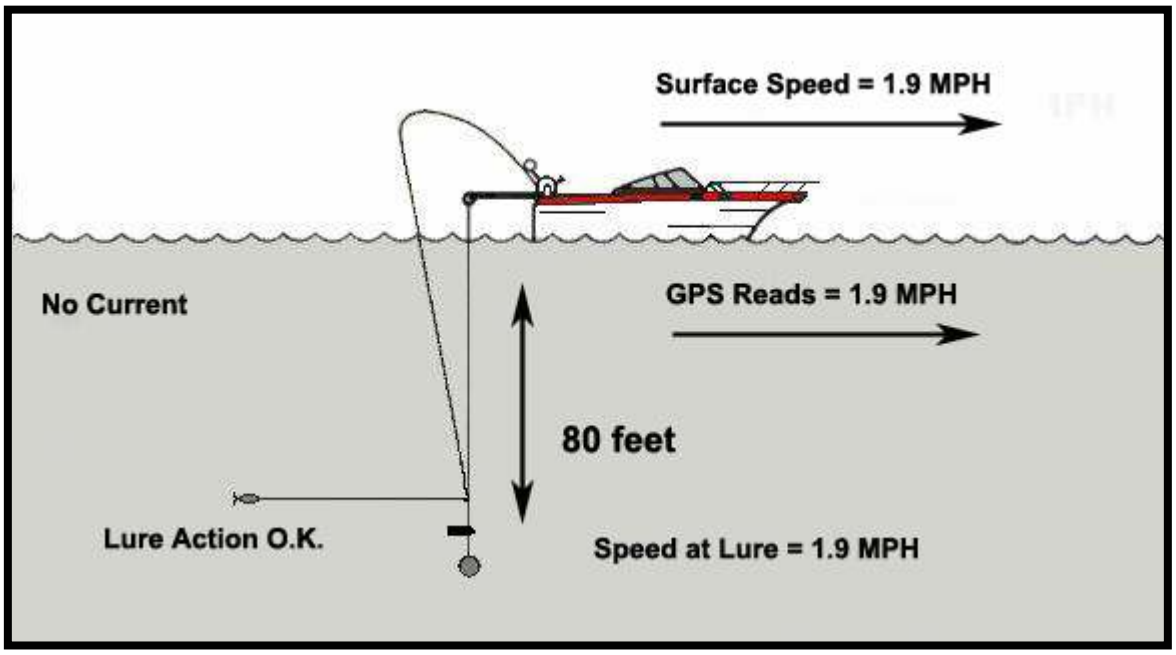

Figure # 3 Trolling in No current

In Figure # 4 the angler is trolling with lure "Y" which has an effective speed of 2.5 mph. The surface speed unit tells him he's in the lower end of the lures effective speed range. The GPS tells him that he's at the upper end of the lures effective speed range. The reason for the difference is he's riding on a 1.0 mph current. The forward speed of the boat plus the current combine to give him a forward speed of 2.9 to 3.3 mph. There is no current where the lure is located so it is being pulled along at 2.9 to 3.3 mph. This angler has a Sub-Troll 900, he knows he has to slow down his boat speed, because the lure is going in and out of control.

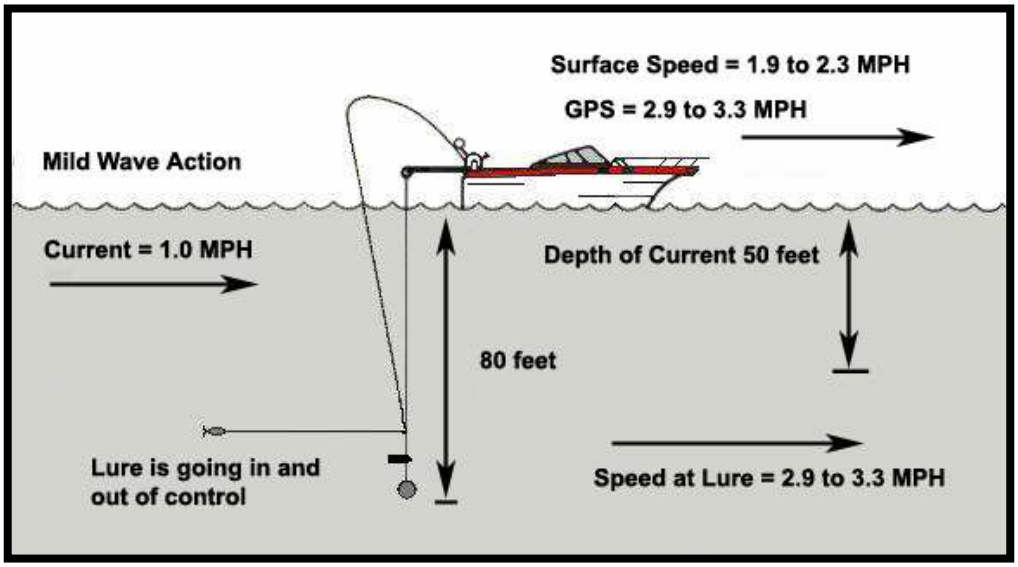

Figure # 4 Trolling with a small current

In figure #5 lets turn around and come back though the current in figure # 4. You're still trolling with lure " Y " which has an effective speed of 2.5 mph. The surface tells him that he's at the lower end of his lures effective speed. Yet his GPS tells him that his lure is dead, hardly moving at all. The reason for the difference is that he's heading into a 1 mph current. The surface speed minus the current is the boats true speed or the speed on the GPS. This angler has a Sub-Troll 900 and knows he has to speed up his boat speed, because the lure is dead in the water.

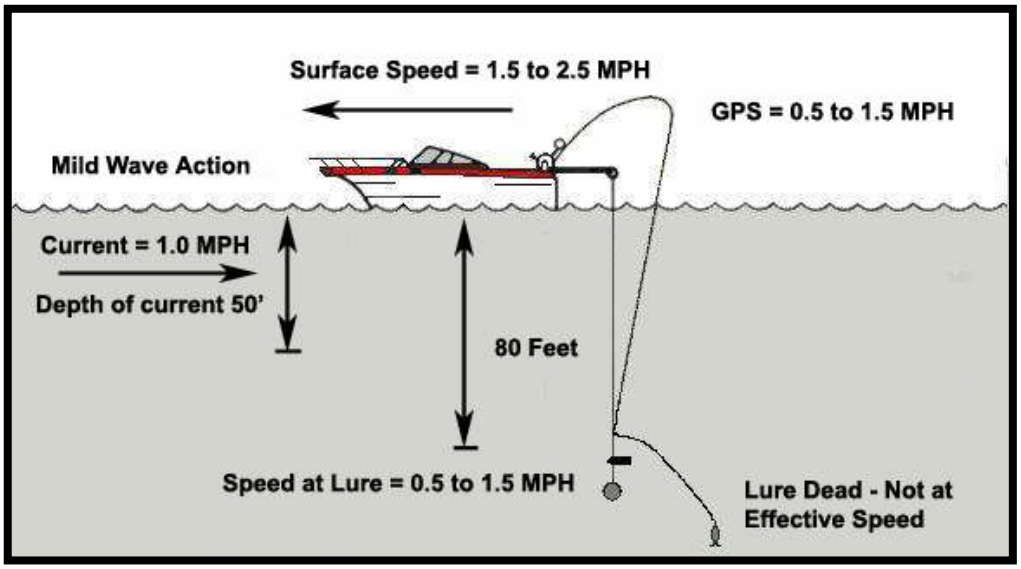

Figure # 5 Trolling into a small current

A strong wind has been blowing for several days and has created a 3.0 mph current. The wind has now died down and the lake is calm. This creates the "look" the water is not moving. But the lake has a top to bottom current of 3.0 mph

In figure # 6, The angler is trolling into the current and pushing a big wake. The surface speed reading tells him the speed is 3.0 to 3.5 mph and his cables are pulling way back. In checking his GPS, it tells him that he's only going 0.3 to 0.5 mph. This is known as "treadmill trolling", you can troll for hours and not cover much ground. By having the Sub-Troll 900 the angler knows he must slow down his boat speed, because his lures are out of control.

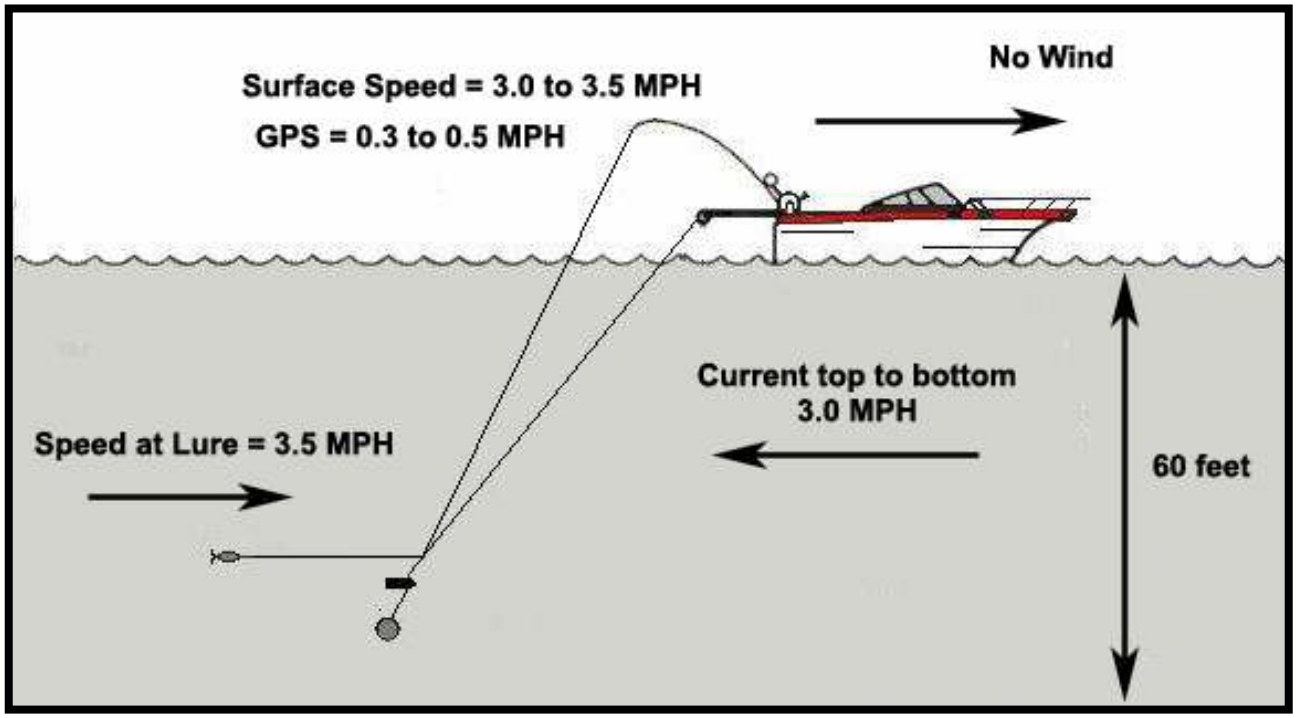

Figure # 6 Trolling against the current on a flat lake

In figure #7, the angler is trolling with the current, the lake is flat. His GPS show he's moving at 3.0 to 3.5 mph, he's trying to brake the boat. But the surface speed unit tells him that he's at idle. This angler is riding on a 3 mph current and his lure is already dead in the water. The best thing he can do in this case is troll broadside to the current or try cutting it at an angle.

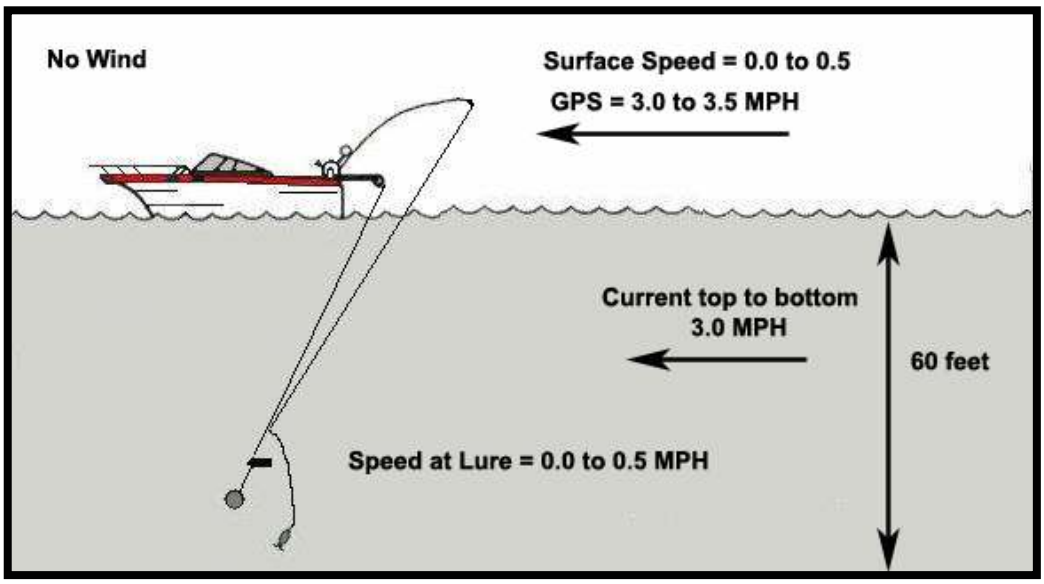

Figure #7 Trolling With a Strong current

In Figure # 8 the angler is trolling with lure "Y" which has an effective speed of 2.5 mph. The surface speed unit tells him he's in the lower end of the lures effective speed range. The GPS tells him that he's at the upper end of the lures effective speed range. The reason for the difference is he's riding on a 1.0 mph current, this current runs about 50 feet. The forward speed of the boat plus the current combine to give him a forward speed of 2.9 to 3.3 mph. At the lure depth of 120 feet he has a facing current of 2.0 mph. This makes the actual lure speed to be 4.9 to 5.3 mph. Having installed the Sub-Troll 900 this angler knows that he must slow down his boat or try cutting it at an angle.

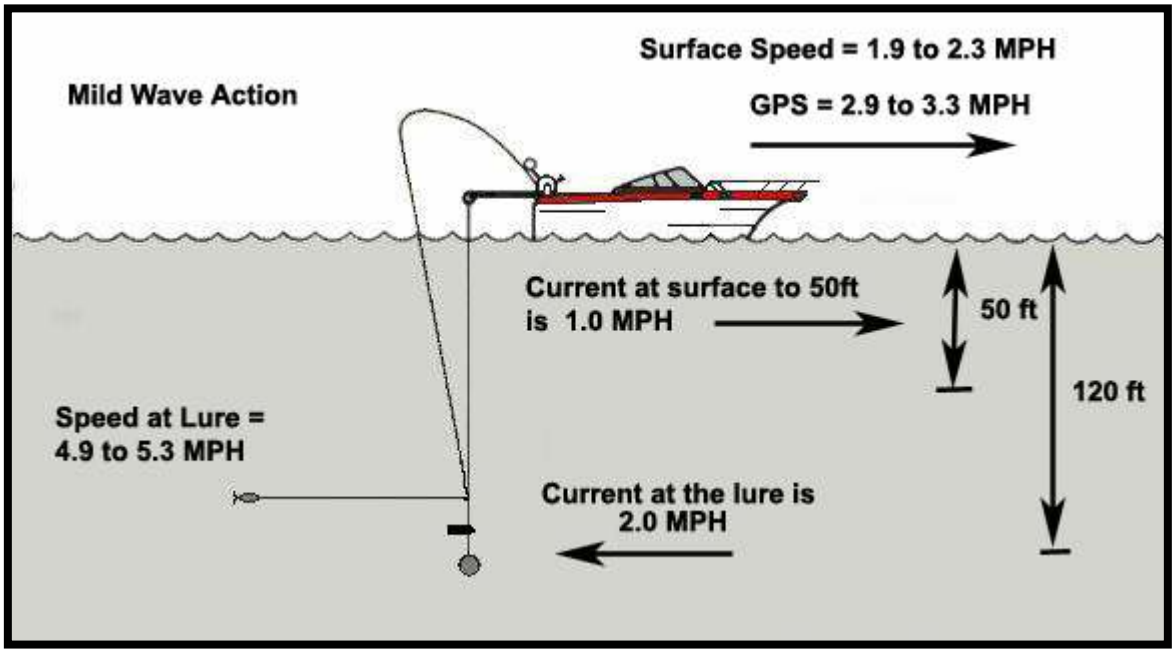

Figure # 8 Trolling with 2 different currents

On the great lakes or any large body of water, never expect the condition to remain the same. You have to constantly re-evaluate speed, wind and water temperature. Always changing the presentation of the lure in accordance with the conditions. We have said it for years but,

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THE RIGHT SPEED , LURE LOOKS LIKE FOOD. THE WRONG SPEED, SPELLS DANGER!

DIGITAL or ANALOG INSTRUMENTS

For the most part, our company prefers analog to digital displays. The reason is that you typically want to see quickly what isn't the case (too fast, too slow), rather than what exactly is the case (10 mph, 3225 RPM, 6.3 gallons). There is an exception to this, temperature which does not change real fast or allow the space for such a dial instrument.

Moor finds that with analog instruments efficiency is their main asset, the spread of the radial numbers against which a clearly visible arm moves across is the best device to date for displaying speed. Being able to establish range (+/-) and see the present speed on the instrument is very easy.

Digital instruments are great for accurately displaying a precise measurement that does not change rapidly. Analog gauges are much better for displaying data were not only the current results are important, but equally important is the direction and rate of change. Position, direction of change, and rate of change are very important on speedometers and analog gauges are inherently much better at displaying those things.

How often have you tried to use your digital speedometer on your graph for trolling, the reading are all over the place (2.0 … 1.6 …. 2.2 ….1.9 …. 2.4). Those digital instruments are giving a precise measurement at that time. A boats speed changes to rapidly due to wind and wave for digital instruments to give a stable reading, especially at slow trolling speed.

The best advantage to analog instruments like the Sub-Troll 900 is ease of view. The Sub-Troll 900 can be read from almost anywhere on the boat. Most digital instruments, reading the display in the direct sunlight is next to impossible. With the Sub-Troll 900 you can always read the display, no matter how bright the sun is.

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