

**Introduction.** Metal Detecting beaches can be a challenge for any detectorist because of the ever changing beach conditions which can be encountered. This article will focus on beach condition changes and their affect on a metal detector's ability to operate correctly over the whole beach.

To start, there are major differences between fresh and salt water beaches and choosing a detector that can operate just fine on a freshwater beach may not be the right answer as a saltwater beach detector. That same freshwater beach detector may fail to operate properly or at all on a saltwater beach. This article will address the two different beach types, multi-function (VLF) detectors and pulse induction (PI) detectors.

Today, there are over 100 detector models offered by manufacturers. There in a table at the end of this article of some of those models. The table has just a few models listed for comparison purposes and note that some of the detectors have been given a ranking number. The ranking goes from one to five with one being the highest rank. The source of information for this table and ranking comes from personal beach detecting experience while using many different detectors and from comments concerning beach detecting and detectors on various hobby related forums.

The table has the manufacturers listed on the left side with various detector models below each of the manufactures' name. Listed across the top of the table are the two beach types fresh and saltwater and below each beach type are the three section of any beach (dry sand, wet sand, underwater).

Color codes (green, yellow, red) are used to show the capability of each model on the various sections of the beach. On the far right side of the table is the detector ranking scale (1 to 5) for freshwater and saltwater detectors. Only five detectors are ranked for each of the two beach types. The capability of a detector to handle a given beach situation determines its ranking in the list. If no rank exist for a given model it just means that the model isn't one of the top five best detectors for beach detecting.

This article does not recommend any specific detector to purchased for beach detecting even if a detector is ranked. The rankings are very subjective and should only be used as a guide to your detector purchasing decision. Before purchasing a detector you must always consider where the detector will be used. Will it be used for fresh or saltwater beaches and on what sections of the beach? The location of the saltwater beach can also be critical in any choice, since saltwater beach mineralization varies from coast to coast (east coast, west coast or on a southern U.S. beach coast). Also other countries may have specific beach detecting conditions that also could influence your detector decision. If you plan on traveling and detecting across the U.S. or in other countries, do your homework to determine the best detector or detectors for your metal detecting adventure.

**Freshwater Beaches** can be found anywhere there is a nice lake, stream or river bank that can be used for swimming. Freshwater beaches offer a couple of challenges to the detectorist both on the beach and in the water. Freshwater and saltwater beaches are usually divide into three major sections:

- dry sand,
- wet sand and
- underwater beach sand.

*The major freshwater beach challenges that a multi-function detector must overcome:*

Freshwater beaches are usually well established and have been in the same location for many years and in some cases for more than a 100 years. The greater the age of a freshwater beach the more metallic trash will be encountered by the detector. The major reason for more metallic trash at a freshwater beach is that there is no corrosive environment that exist like on a saltwater beach, so the metallic material does not corrode rapidly or in some cases not at all. This means metallic trash (bobby pins, pull tabs, bottle caps, nails, foil, etc.) cumulate over time on a freshwater beach. This also implies that much more trash will be found in the deeper layers of sand and clay or mud bottom of a freshwater beach.

One of the reasons to detect a beach is to find jewelry and if the trash content of the beach sand is very high, the trash may mask a jewelry target signal from the detector being used. When water detecting on a freshwater beach keep in mind that the underwater portion of the beach may have the same level of trash as the beach dry sand. If this is the situation, you will be digging and retrieving a lot of trash and that is not much fun in waist deep or deeper water. Hint: Try to always detect freshwater beaches in the fall when the water level is lowest. Low water levels expose more beach and target retrieval become a much easier task.

Another reason that freshwater beaches have more trash is that there are no swells (except very large lakes). Large swells and surf action remove sand and also take trash off the beach to deeper water. This is usually **NOT** true for smaller inland lakes, rivers and streams.

Another thing to consider is that some detectors will operate correctly in dry sand but become unstable in wet sand or in the water. Always give consideration to the effects that wet sand and fresh water have on a metal detector's operation before purchasing a detector.

The detectors used on a freshwater beach and in the water should have the following:

*Must have features in a multi-function detector -*

- waterproof to some depth level (only if you plan on water detecting),
- extremely fast target response (aids in target signal separation),
- very good target discrimination adjustment capability,
- coil interchangeability is extremely important to aid in target separation (small coils: 5", 8", 3x6", 6x9", etc),
- light weight and ergonomically comfortable for the user.

*Want to have features in a multi-function detector -*

- tone I.D. and / or optional digital display I.D. capability,
- ground balance capability,
- capability to also be used on saltwater beaches and in saltwater.

In summary; use the list of features above and compare them to the detectors ranked for freshwater beaches. The best detector choice will have many these features. Always get other detectorists' opinions and input before buying. This article is just one input to your detector purchasing decision.

Keep in mind that using metal detector discrimination to mask out trash is **NEVER** the right thing to-do while beach detecting. For good and bad target separation changing the detectors coil to a smaller size this can be a very good alternative. Another detector specification to overcome target masking is how fast the detector responds to a given target signal, the faster the detector's response the better target signal separation between multiple targets for a given sweep of the coil.

**Saltwater Beaches** are heavily used by the public and therefore are considered an ideal place to metal detect. Saltwater beaches are usually divide into the same three major sections as freshwater beaches:

- dry sand,
- wet sand and
- underwater beach sand.

The Dry Sand portion of the beach can usually be detected by many of the median and higher priced detector models. But just turning on the detector and going for it will not always work, therefore, the detectorist needs to know their detector's capability and adjust it for correct operate at the beach.

Wet Sand detecting on a saltwater beach requires a detector designed to handle high concentrations of mineralization, black sand, all of which is mixed with saltwater. This type of detecting environment limits the number of detectors available. The detectors for use in this situation will frequently cost more than \$1,000 in price.

Underwater saltwater detecting has the same requirements as a saltwater wet sand detector in addition it must be completely waterproof.

*The major challenges on a saltwater beach that a multi-function detector must overcome:*

The greatest challenge to detecting a saltwater beach is the sand mineralization, black sand deposits and the saltwater itself. All of these components are conductive and will influence the detectors capabilities to operate correctly. These conditions cause many detectors to not ground balance and give false target signals due to the conductivity of the sand's mineralization content and saltwater.

Trash tends not to be a dominate factor for saltwater beach detecting. This is because there is a yearly beach cycle that takes place on a saltwater beach where in the winter months storm surf and swell action removes sand from the beach and along with the sand the trash is also removed. Another factor is the rapid decomposition of metallic materials on saltwater beaches. This decomposition is accelerated by the highly corrosive beach environment.

The depth of the sand can also be a factor on saltwater beaches. Saltwater beach sand can have a depth of many feet and this along with the corrosive and conductive sands can challenge most detecting equipment.

*Must have features in a multi-function detector -*

- waterproof to some depth level,
- capability to operate in a saltwater environment (no false target signals),
- coil interchangeability is extremely important to gain coverage & depth (large coils: 10", 112", 15", etc),
- tone I.D. and / or optional digital display I.D. capability.

*Want to have features in a multi-function detector -*

- very good target discrimination adjustment capability,
- light weight and ergonomically comfortable for the user,
- ground balance capability.

In summary if a detector works well in a saltwater environment it will be very compatible for most freshwater beach detecting providing the beach is light in trash. There is a tendency to use larger coils on a saltwater beach (10", 12", 15" and larger) since trash is not a dominate challenge to saltwater beach detecting. Larger coils also provide for greater coverage and depth. Rapid detector response is not required on a saltwater beach.

**PI (Pulse Induction) Detectors generally** have the capability to ignore high mineralization beach environments while providing good sensitivity to most metallic targets. Performance is usually consistent on any type of beach but there are exceptions. When a beach has a very high concentration of black sand deposits, adjustments may be required even on a PI detector.

The PI detectors designed today have many different capabilities and features between the different manufacture models such as: ferrous and non-ferrous discrimination (two tone ID), ground balance, dual frequency operation, coil size and bouncy, pulse delay control, VCO mode, audio frequency control, ground tracking speed, threshold control, etc.

The basic PI is usually pretty much a turn-on and go detector with just a couple of adjustments and the learning

curve is usually very short. Since the basic PI provides only a single target tone the user only needs to learn how the tone may be slightly altered with different shaped targets.

PI detectors are **not** a good choice for any type of freshwater beach detecting. The reason is that PI detectors **react to all metallic trash** as well as good targets. Since saltwater beaches have **LESS** trash (usually) the PI can be a good choice for wet sand and underwater detecting.

In some situations using a (PI) pulse induction detector can be very beneficial and the decision to invest and use a PI is very operator dependent. There are a number of PIs in the table but no ranking exist since there is a good deal of differences between the various models.

**In summary** there are some differences between the detector used on freshwater beaches vs. saltwater beaches. The differences can be compared in the must and wants section for each beach type. There is usually a few hundred dollars more in price making a saltwater beach detector more expensive.

**Here is a comparison of the must and want features for a freshwater and saltwater detector.**

**Freshwater Detectors**

*Must have features in a multi-function detector -*

- waterproof to some depth level (only if you plan on water detecting),
- extremely fast target response (aids in target signal separation),
- very good target discrimination adjustment capability,
- coil interchangeability is extremely important to aid in target separation (small coils: 5", 8", 3x6", 6x9", etc),
- light weight and ergonomically comfortable for the user.

*Want to have features in a multi-function detector -*

- tone I.D. and / or optional digital display I.D. capability,
- ground balance capability,
- capability to also be used on saltwater beaches and in saltwater.

**Saltwater Detector**

*Must have features in a multi-function detector -*

- waterproof to some depth level,
- capability to operate in a saltwater environment (no false target signals),
- coil interchangeability is extremely important to gain coverage & depth (large coils: 10", 112", 15", etc),
- tone I.D. and / or optional digital display I.D. capability.

*Want to have features in a multi-function detector -*

- light weight and ergonomically comfortable for the user,
- very good target discrimination adjustment capability,
- ground balance capability.

Finally, any detector that can operate without giving false target signals in a saltwater beach environment and needs no adjustment between the different beach sections (dry, wet and underwater) is an excellent choice. One way to choose a detector is to purchase it for saltwater use and it will be generally be suitable enough for freshwater beaches.

*See the table color codes for a guide between fresh and saltwater detectors compare the green, yellow and red areas of the table. Hint: Compare the amount of color bars between freshwater and saltwater detectors.*

**Your Detector Input** is very much appreciated on any detector that works or does not work on either freshwater or saltwater beaches. Just provide the detector model's name and give a brief description on how it performs on each beach type (fresh and salt) and beach section (dry, wet, and under water). [MDHTALK Email](mailto:MDHTALK@GMAIL.COM)

Detectors	Beach Metal Detecting						Fresh	Salt
	Fresh Water			Salt Water				
	Dry Sand	Wet Sand	Under Water	Dry Sand	Wet Sand	Under Water	Ranking	
<b>Minelab</b>								
CTX 3030			Underwater		Special Program Requirements			5b
Excalibur (Old & New Models)			Underwater			Underwater	4	1
Explorer Series (XS to ET Models)			Wading			Wading	5	4
Eureka Gold				Sen. Reduction				
Sovereign Series (Old & New Models)			Wading			Wading	3	3
X-Terra Series			Wading	Sen. Reduction				
<b>White's</b>								
Beach Hunter & BHID			Underwater			Underwater		5a
DFX (Old & New Versions)			Wading			Wading		
MXT & MXT Pro			Wading	Sen. Reduction				
Surf Dual Field (PI)	*****	Too Much Trash	Underwater	Trash Issue		Underwater		
Surfmaster (PI)	*****	Too Much Trash	Underwater	Trash Issue		Underwater		
Vision / v3i			Wading			Wading		
XLT Series (Old & New Versions)			Wading		Sen. Reduction	Wading		
<b>Fisher</b>								
CZ20 & CZ21			Underwater			Underwater	4	2
F2		Sen. Reduction		Sen. Reduction				
F75 Series		Sen. Reduction		Sen. Reduction	Falsing			
Goldbug Two				Sen. Reduction				
Gold Bug Pro				Sen. Reduction				
1280			Underwater	Sen. Reduction		High Level of Falsing		
<b>Tesoro</b>								
Cibola					Sen. Reduction			
Compadre								
Sand Shark (PI)	*****	Too Much Trash	Underwater	Trash Issue		Underwater		
Silver UMax								
Stingray			Underwater	Sen. Reduction				1b
Tejon		Sen. Reduction						
Tiger Shark			Underwater	Sen. Reduction		Major Adjustment Required		1a
Vaquero		Sen. Reduction		Sen. Reduction				
<b>Garrett</b>								
ACE 150								
ACE 250			Wading	Sen. Reduction				
ACE 350			Wading	Sen. Reduction				
AT PRO			Underwater			Beach and Coast Dependent		2
Infinium (PI)	*****	Too Much Trash	Underwater		Adjustment Critical	Underwater		
Sea Hunter (PI)	*****	Too Much Trash	Underwater	Trash Issue		Underwater		
<b>Detector Pro</b>								
Head Hunter Pulse (PI)	*****	Too Much Trash	Underwater	Trash Issue		Underwater		
Headhunter Wader			Underwater		Unknown	Unknown		
	Good	Very Good to Excellent						
	Caution	May Need To Adjust Sensitivity or in the Case of a PI to Much Trash						
	Stop	Will Not Operate Correctly						
		Wadding Only						
		Metal Detecting Hobby Talk <a href="http://www.mdhtalk.org">http://www.mdhtalk.org</a>						