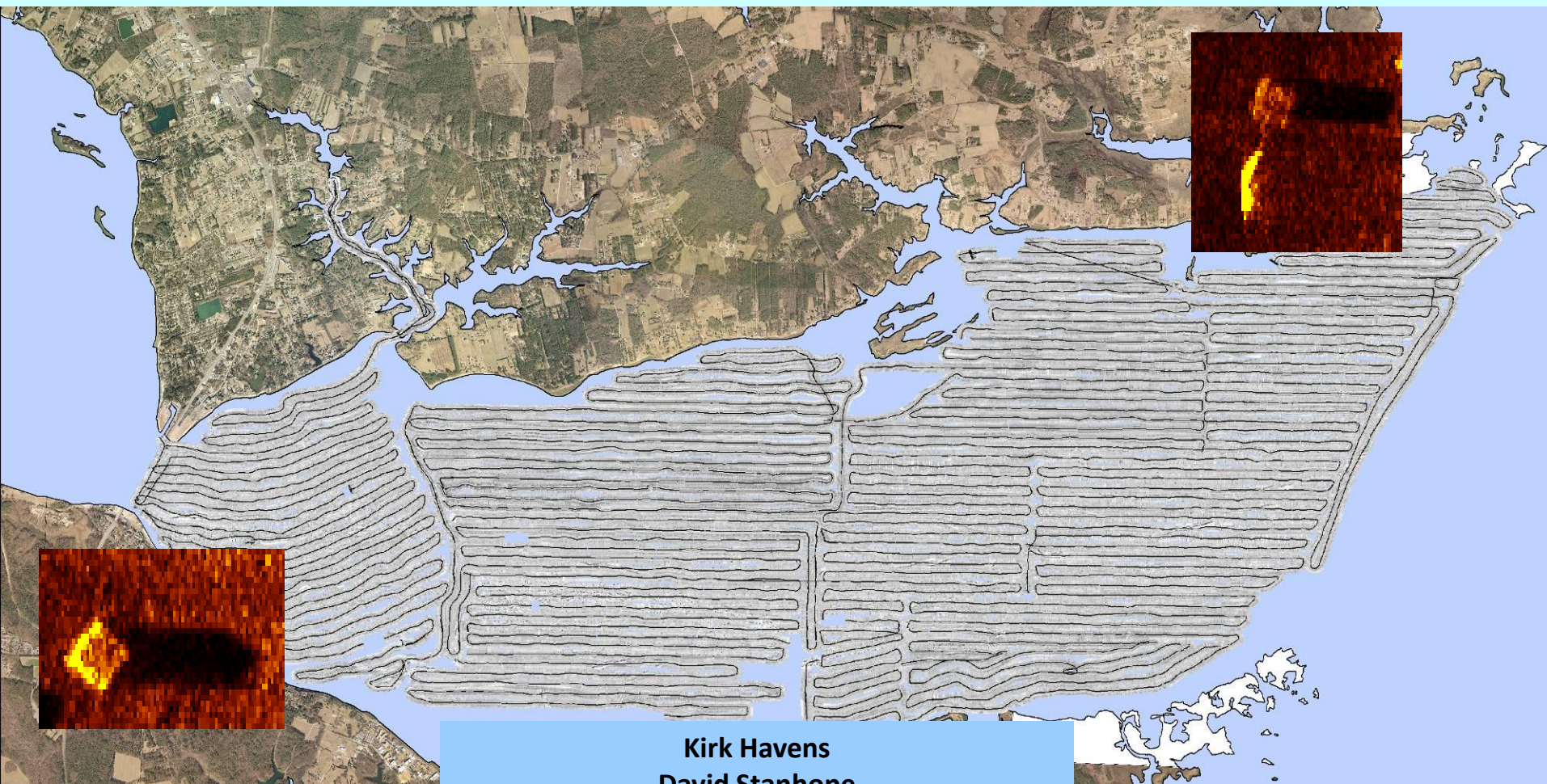


# Marine Debris Removal



**Kirk Havens  
David Stanhope  
Kory Angstadt**  
Center for Coastal Resources Management  
Virginia Institute of Marine Science

Sarah Creek ghost pots



Ghost pots removed January/February 2006





Derelict traps identified and removed:

2005 16 derelict traps

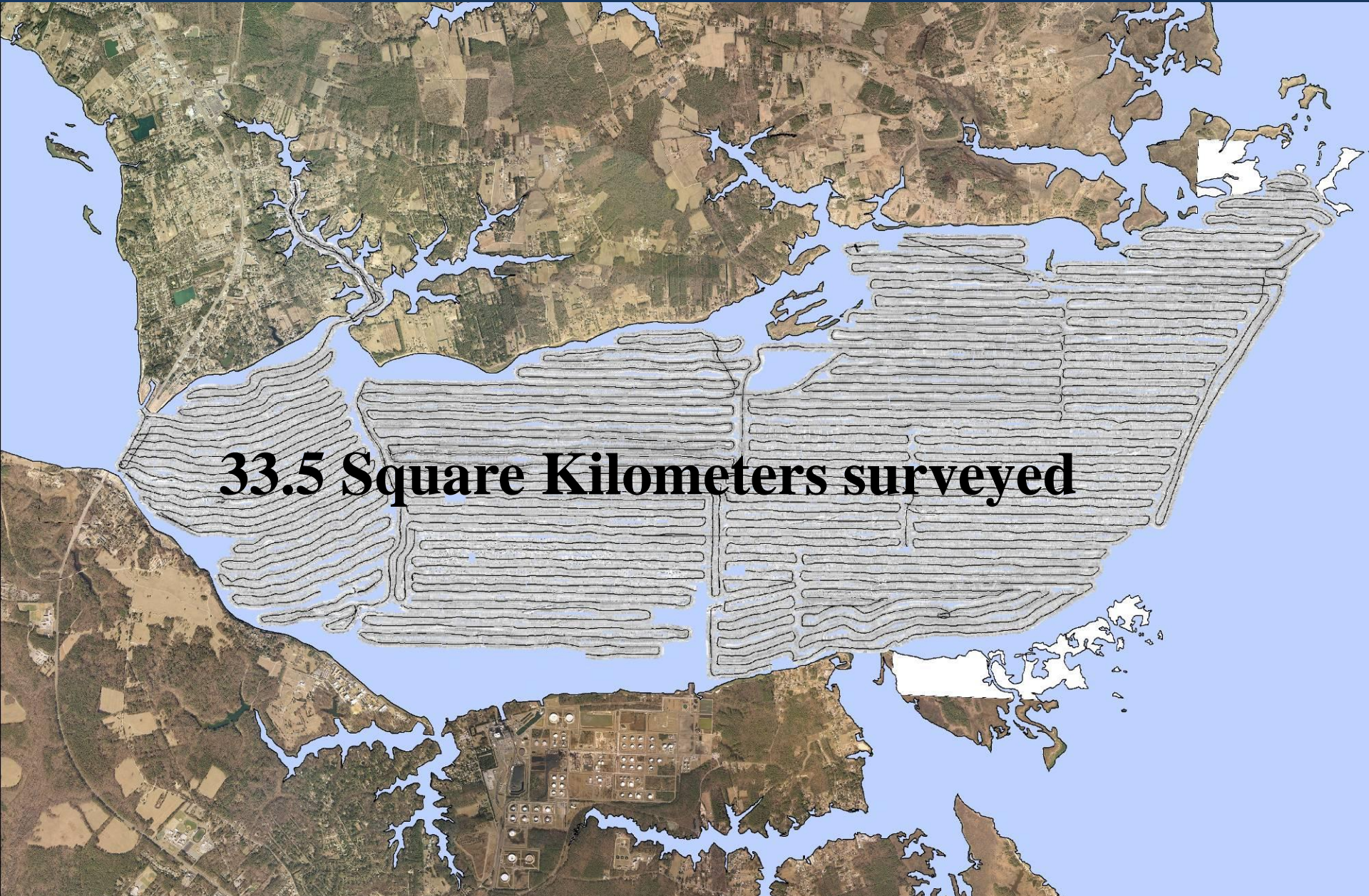
2006 12 derelict traps

2007 11 derelict traps

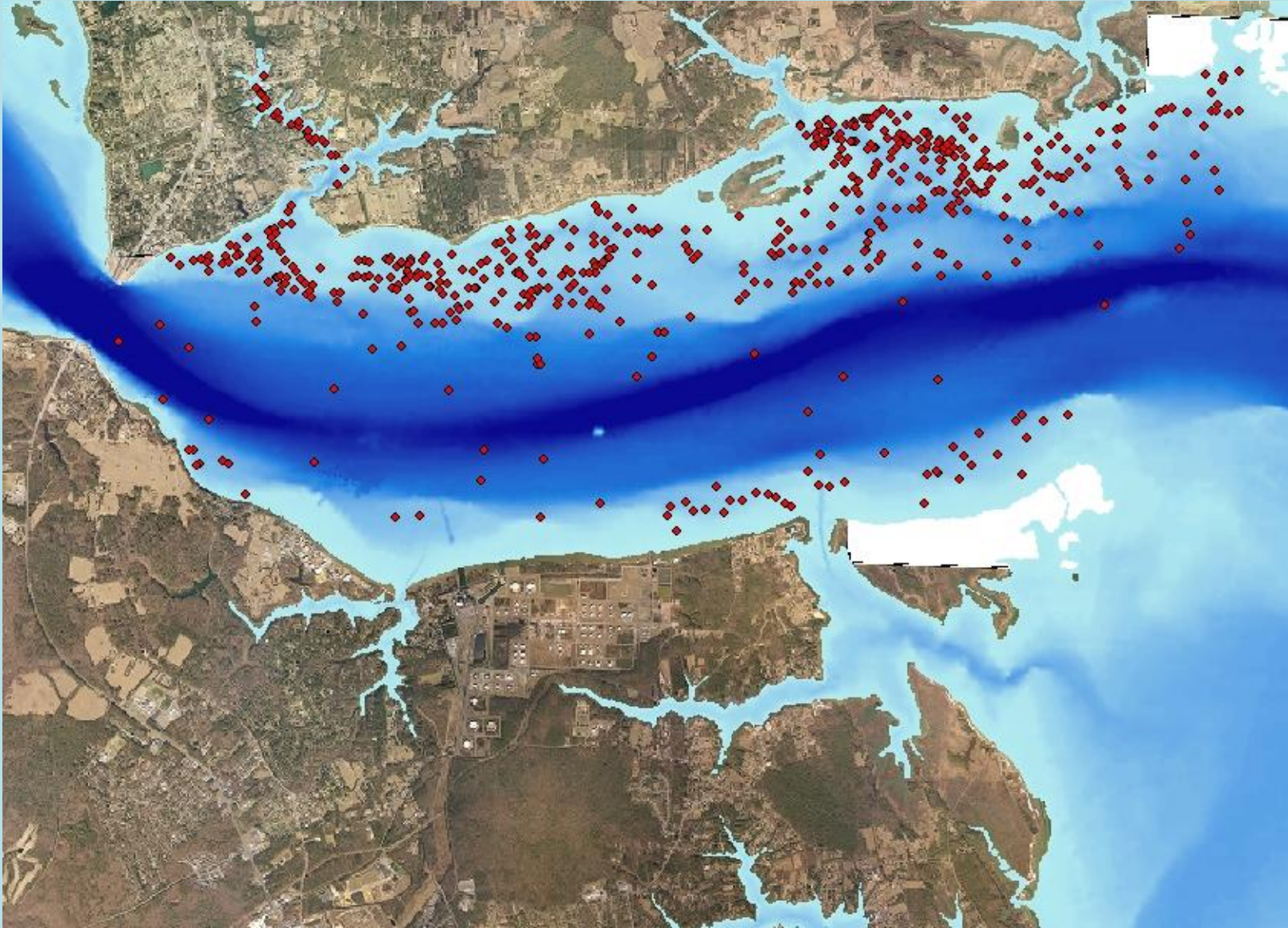
Trap loss rate approx. 20 – 30% per year



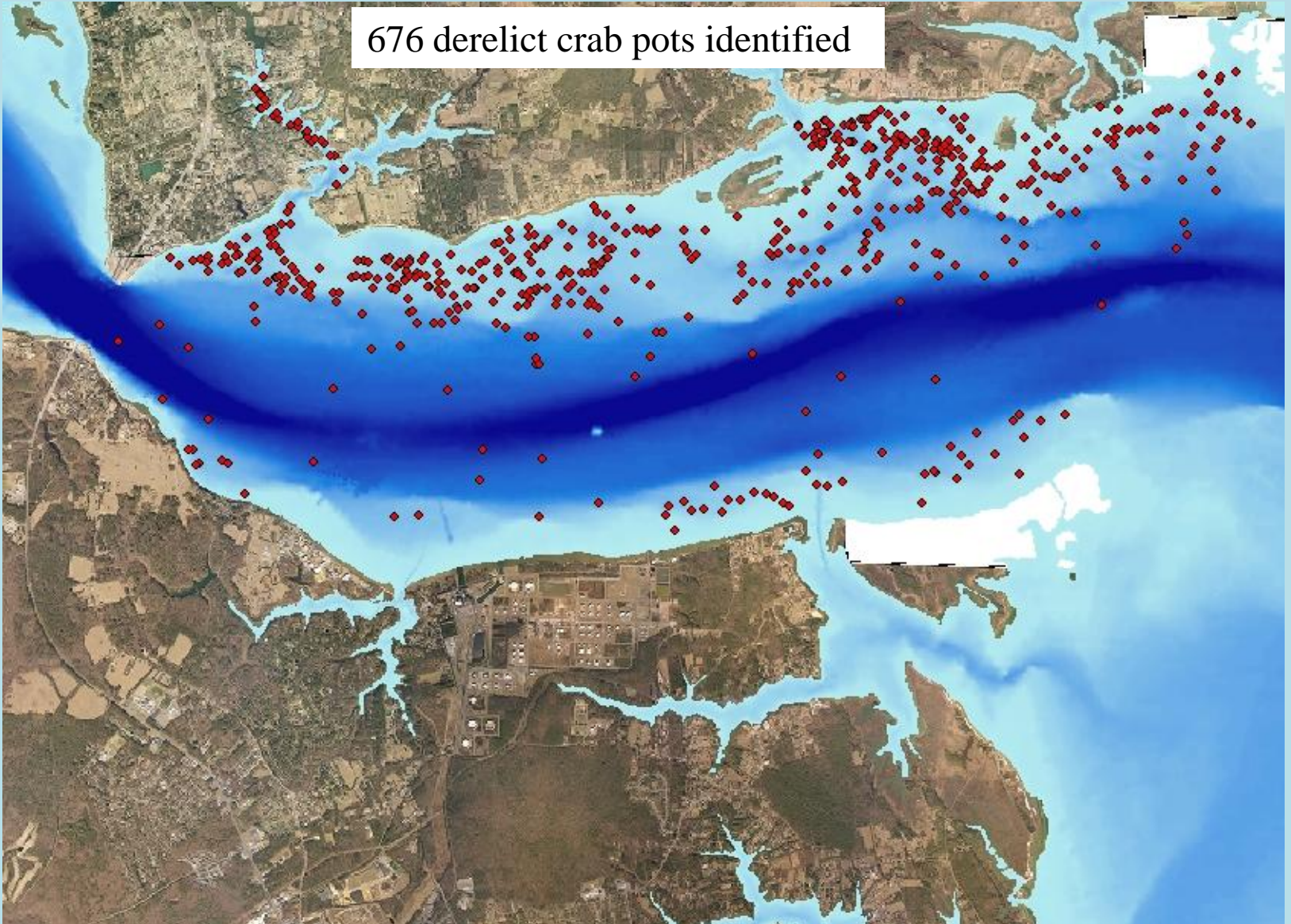
# York River Marine Debris Survey- Jan/Feb 2006 (Off-season)



**33.5 Square Kilometers surveyed**



676 derelict crab pots identified

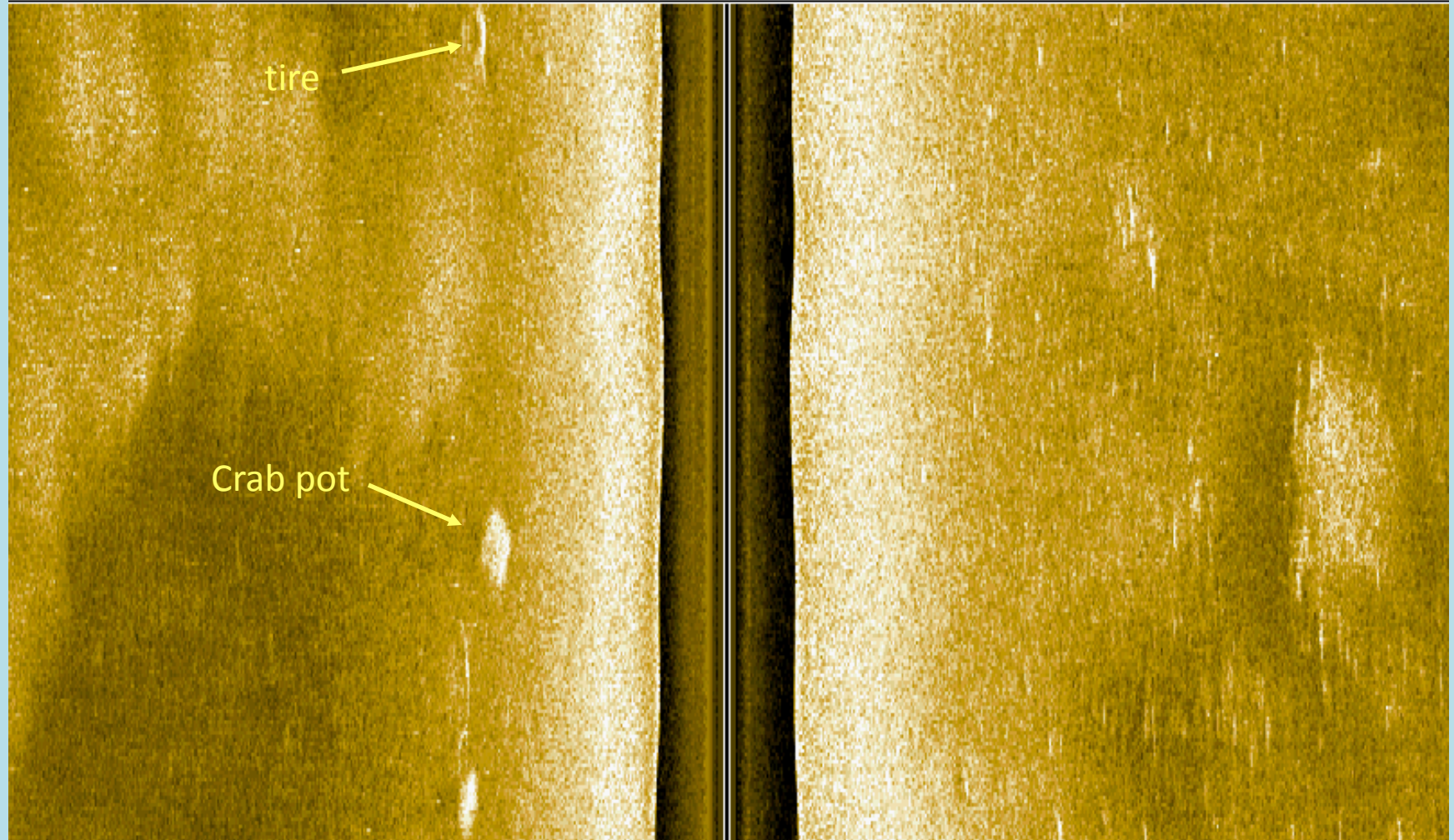


# Overview

- Side scan images of debris
- Survey Techniques
- Humminbird Unit
- Debris retrieval and disposal

75 Left

Right 75



Depth	ft	Temp	°F	Speed	kts	Course	°t	VLT	V
<b>13.8</b>		<b>64.1</b>		<b>3.1</b>		<b>240</b>		<b>12.6</b>	



**60.1** ft

Cursor

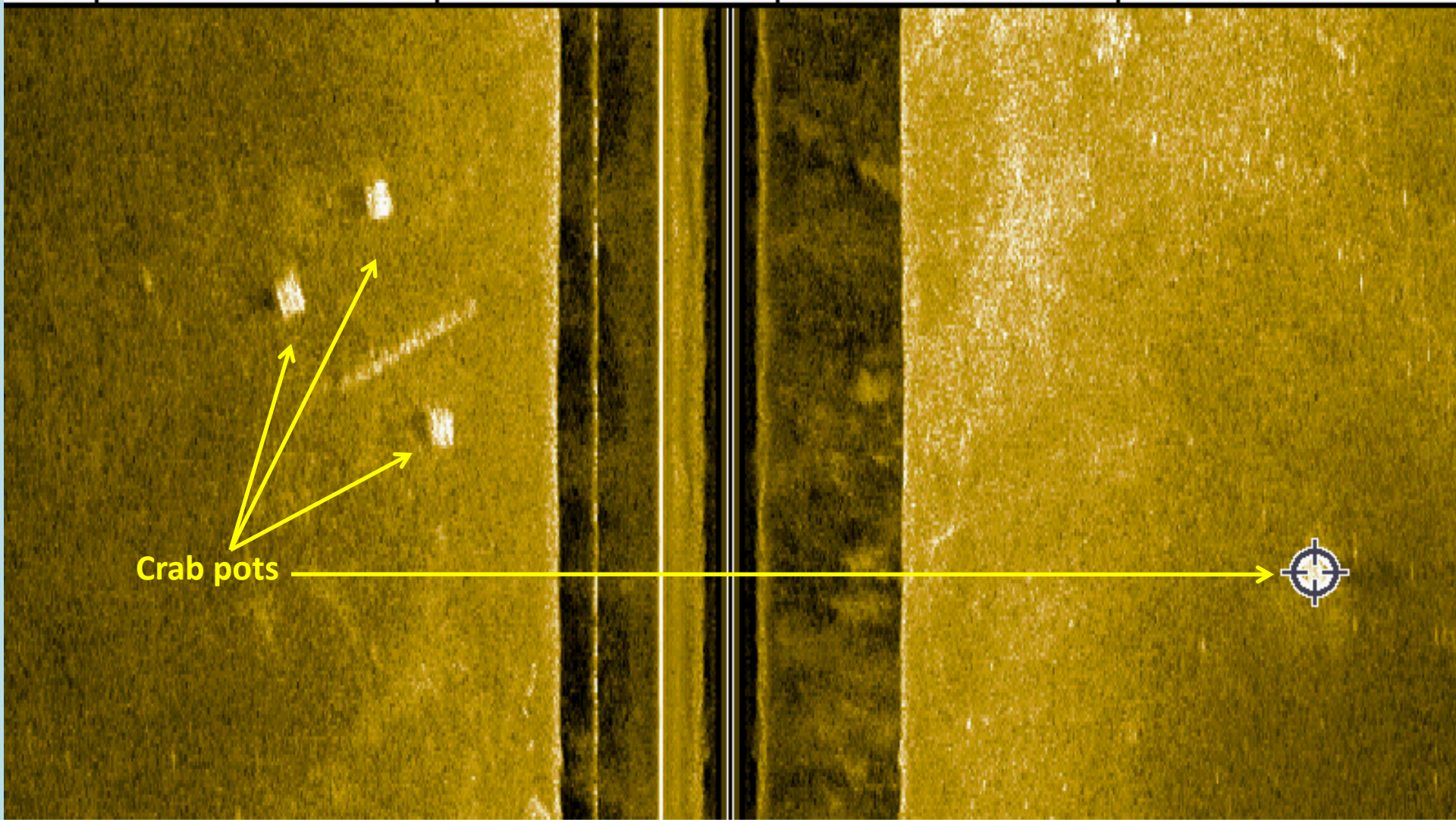
Depth

**336** ft

Distance

**345** °t

Bearing



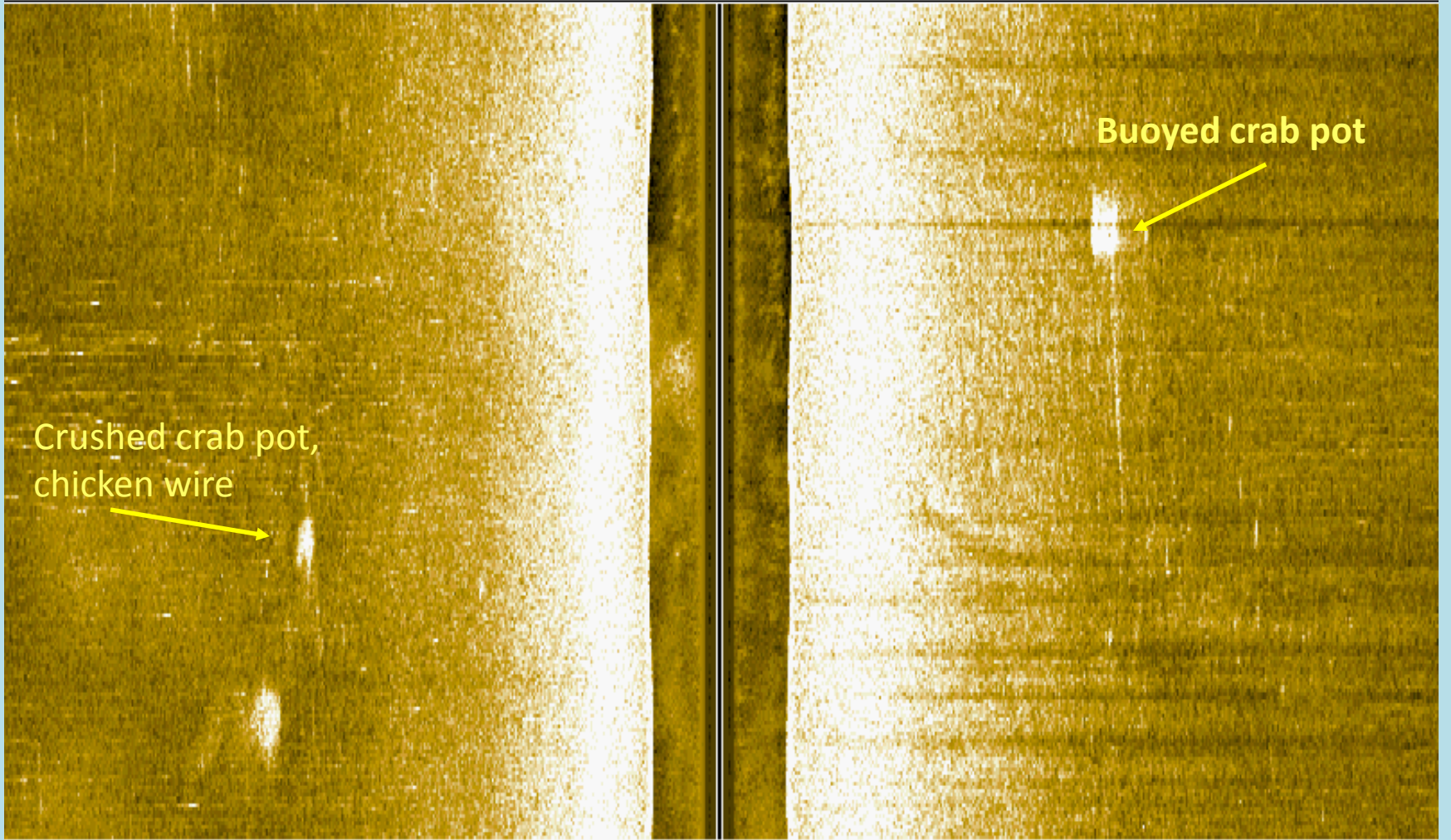
Crab pots



Depth	ft	Speed	kts	Course	°t		
<b>16.6</b>		<b>4.4</b>		<b>074</b>		N 37.82978°	<b>12:21:45 PM</b>
						W 076.28154°	<b>12/22/08</b>

75 Left

Right 75



Crushed crab pot,  
chicken wire

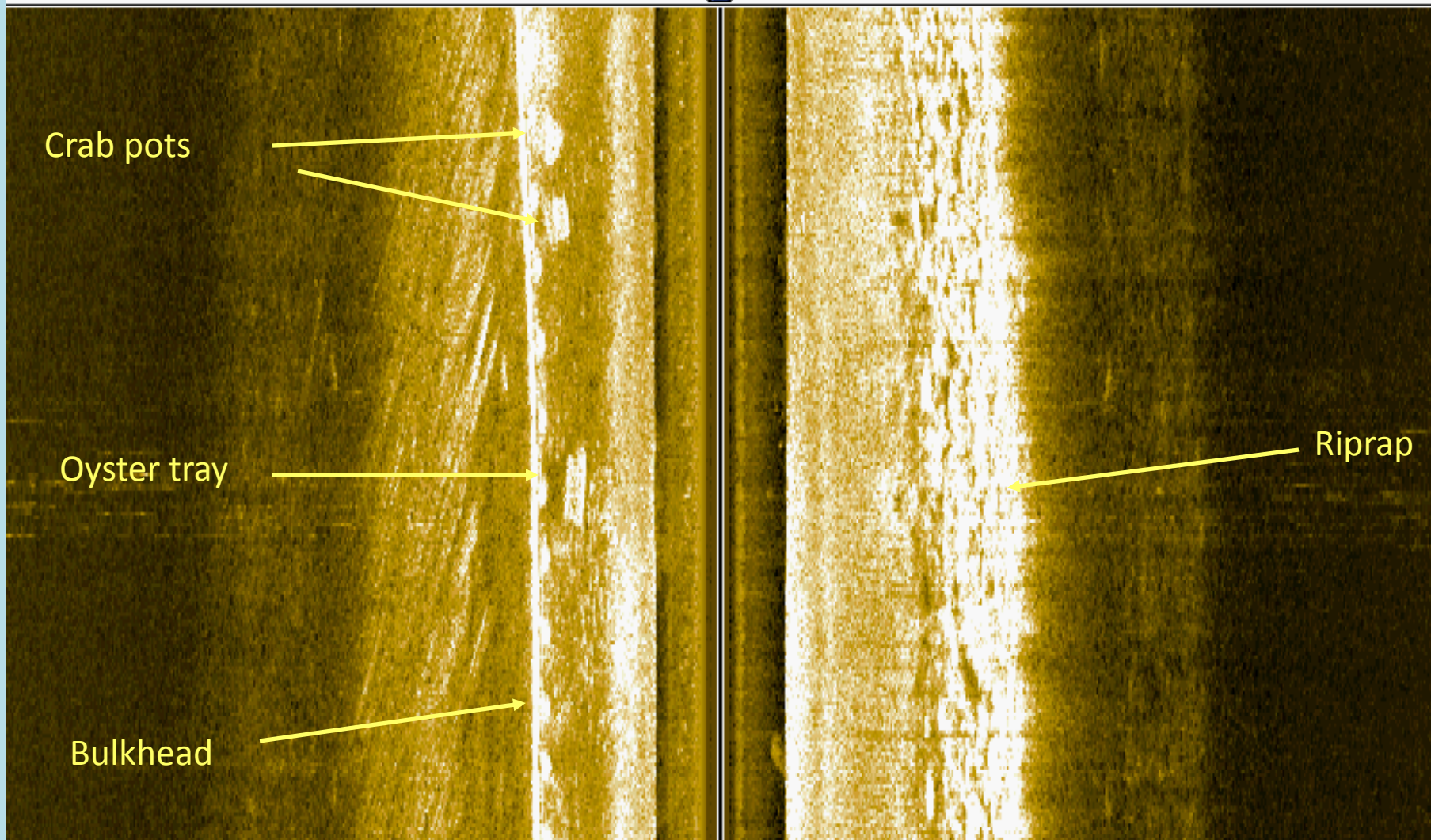
Buoyed crab pot

Depth | ft | Temp | °F | Speed | kts | Course | °t | VLT | V

**13.4** | **64.1** | **3.7** | **065** | **12.6**

75 Left

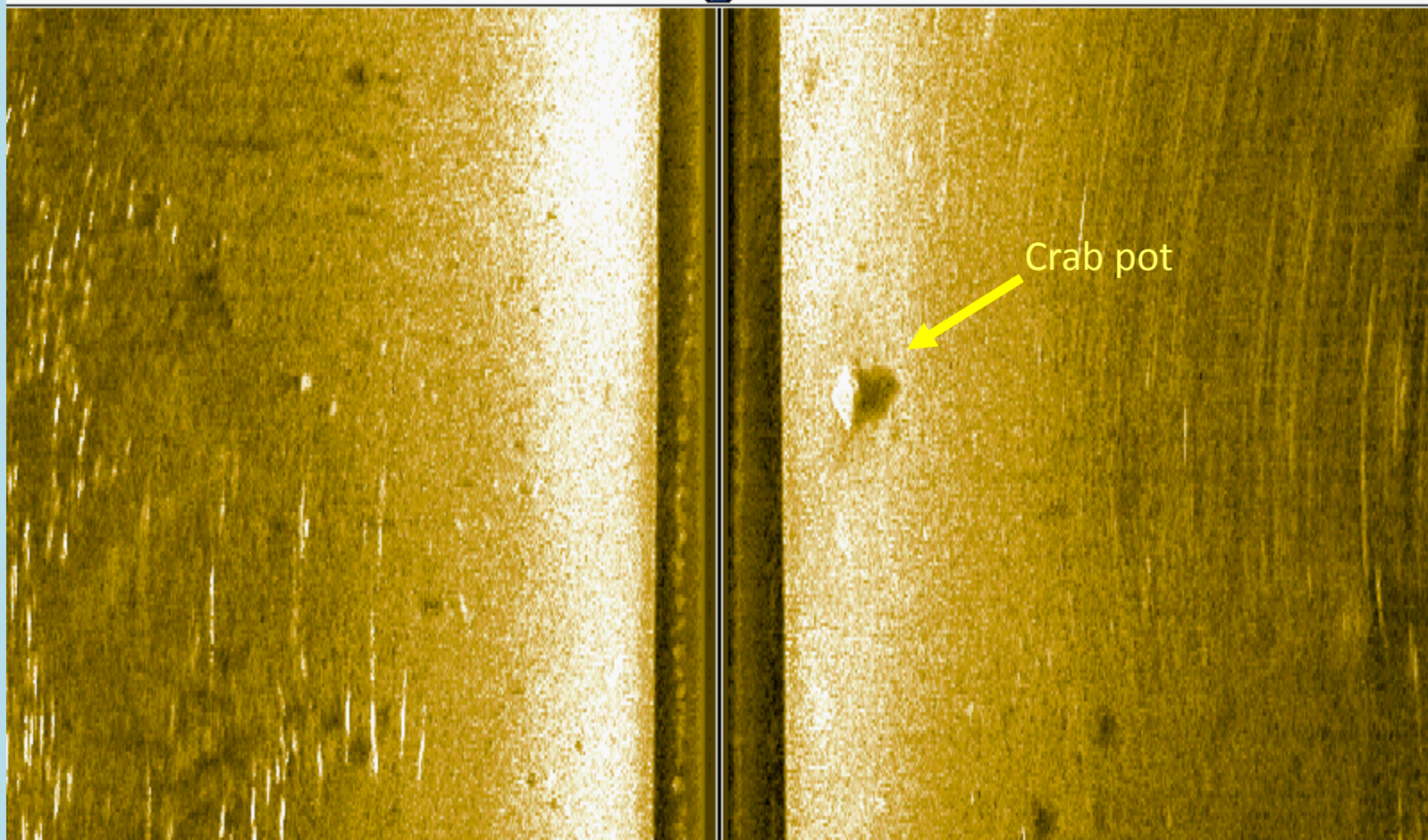
Right 75



Depth	ft	Temp	°F	Speed	kts	Course	°t	VLT	V
<b>6.8</b>		<b>63.0</b>		<b>4.1</b>		<b>030</b>		<b>12.6</b>	

75 Left

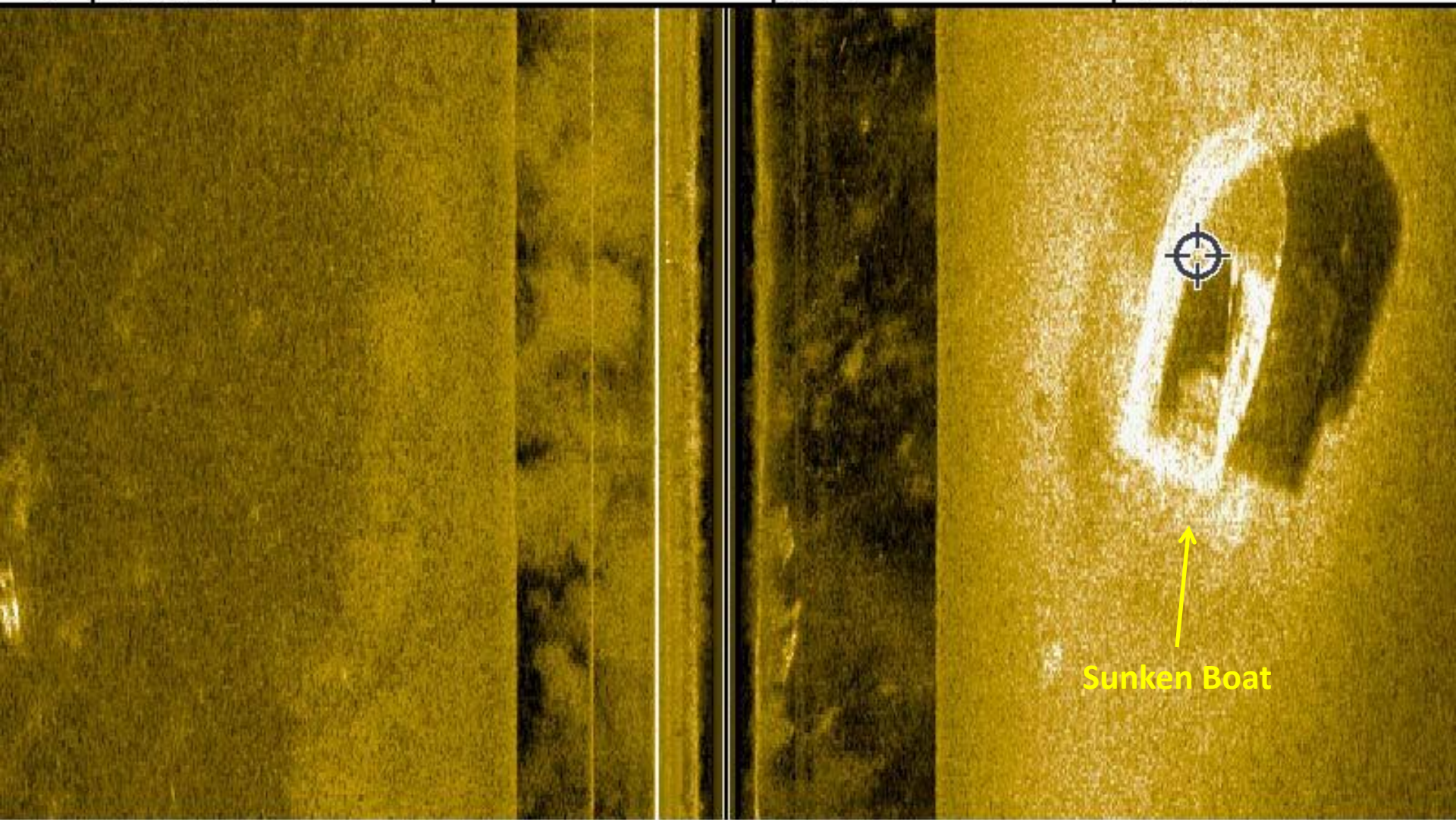
Right 75



Crab pot

Depth	ft	Speed	kts	Course	°t		
<b>5.8</b>		<b>3.5</b>		<b>315</b>		N 37.25992°	<b>10:43:41 AM</b>
						W 076.48144°	<b>12/04/08</b>

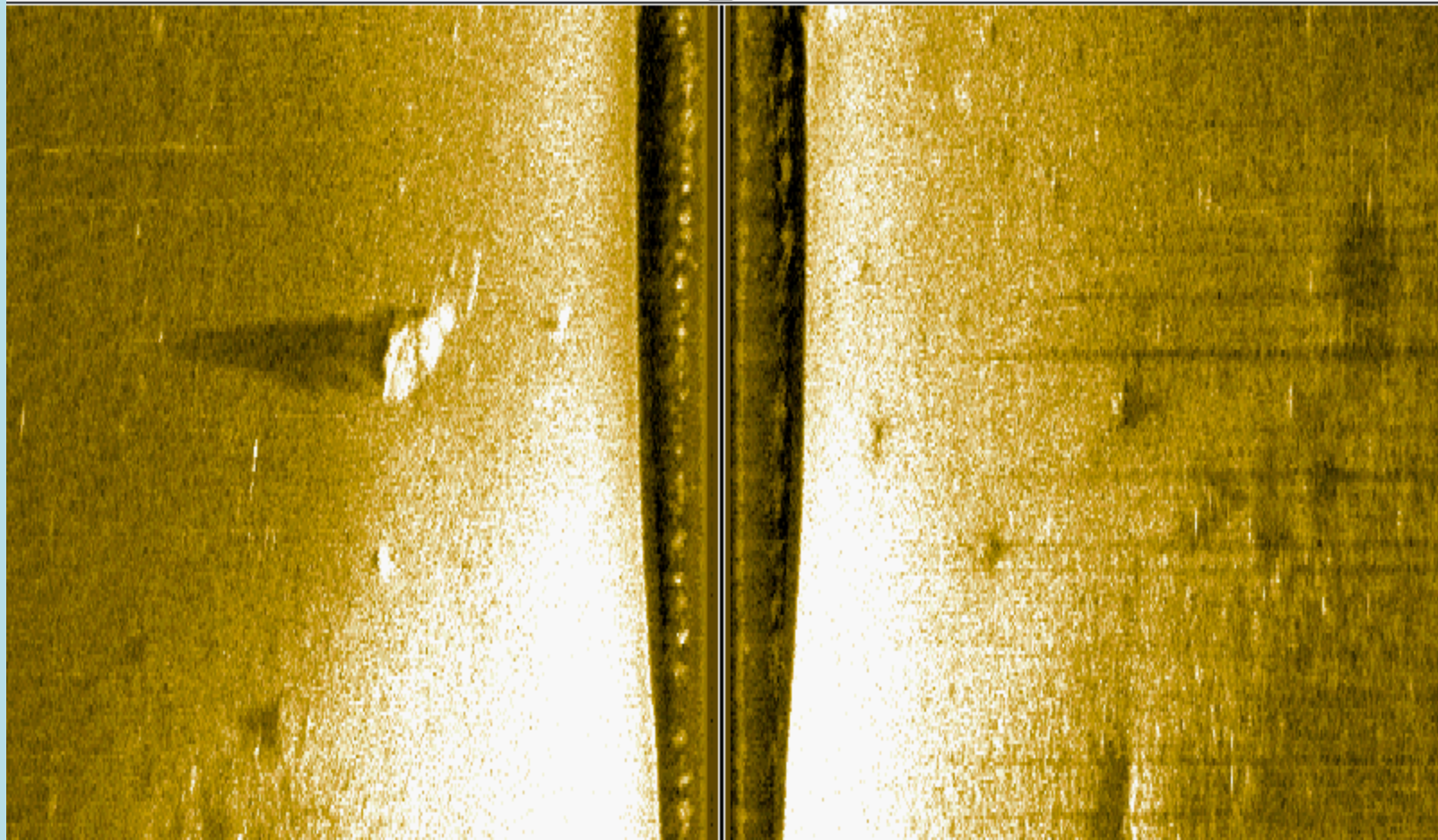
 **48.4** ft Cursor | Depth **98** ft | Distance **132** °t Bearing



Depth **21.5** ft | Speed **5.3** kts | Course **336** °t | N 37.82029° | 7:51:56 AM  
W 076.29806° | 1/02/09

75 Left

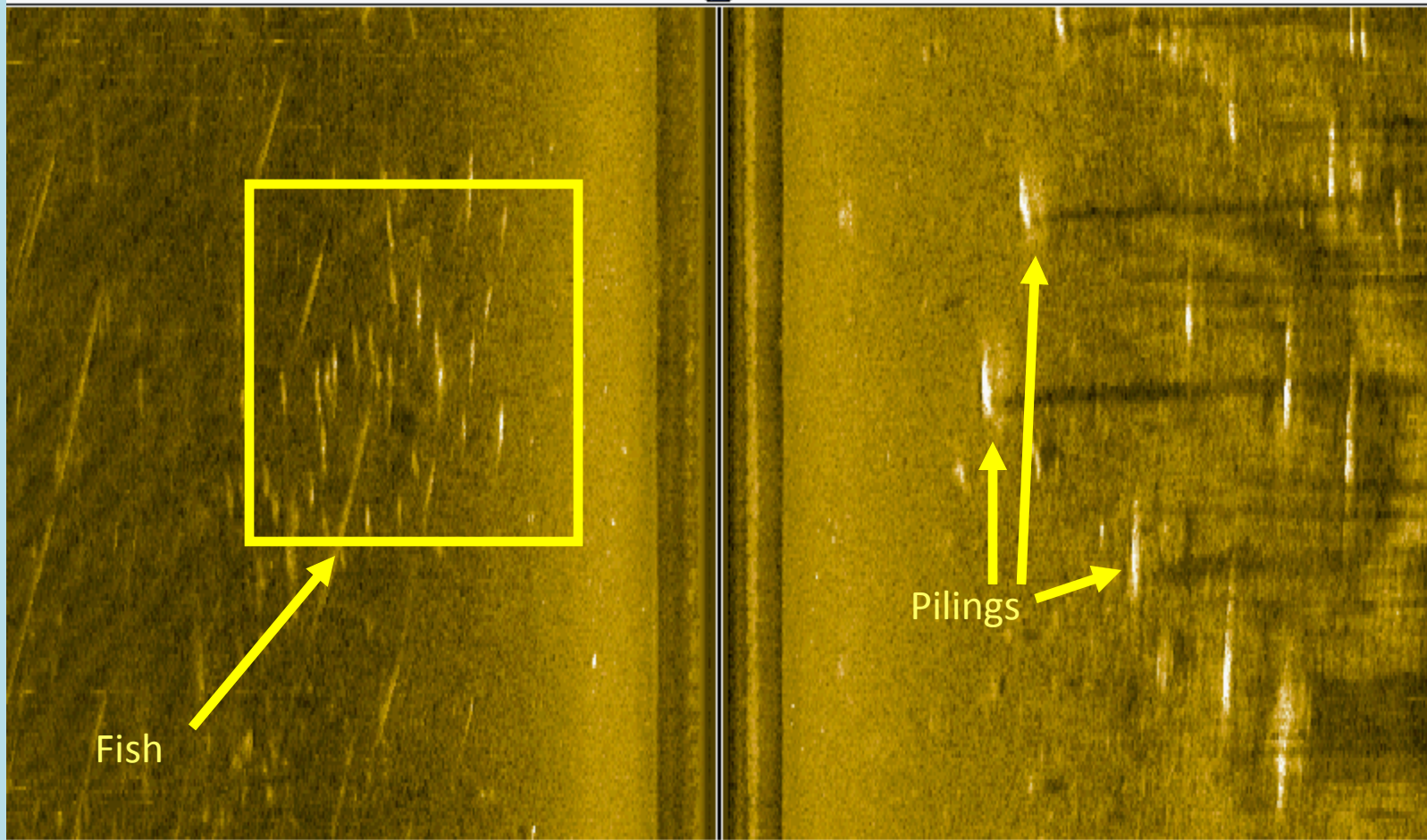
Right 75



Depth	ft	Speed	kts	Course	°t		
<b>8.8</b>		<b>4.0</b>		<b>152</b>		N 37.25796°	10:46:58 AM
						W 076.47858°	12/04/08

75 Left

Right 75



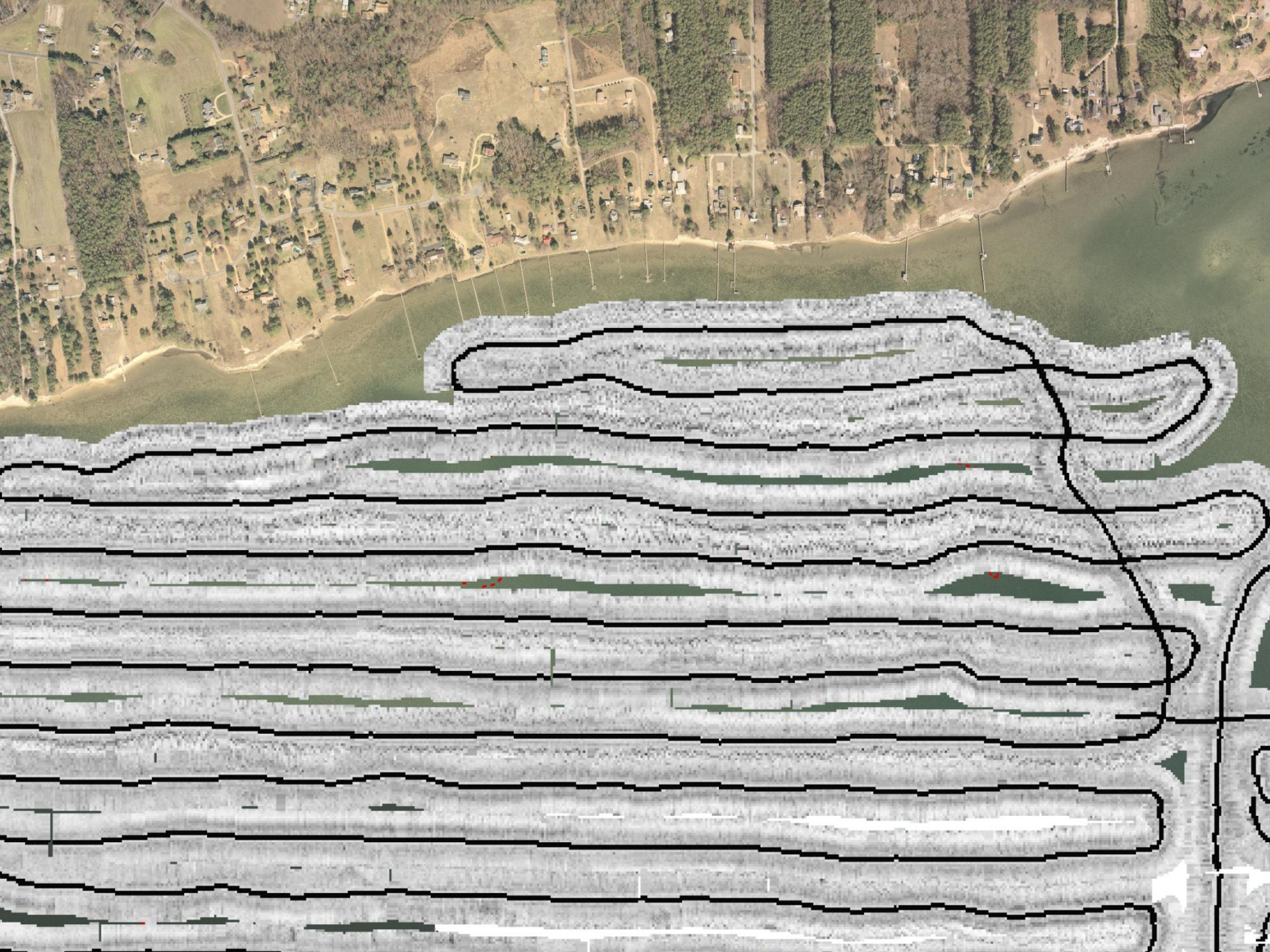
Fish

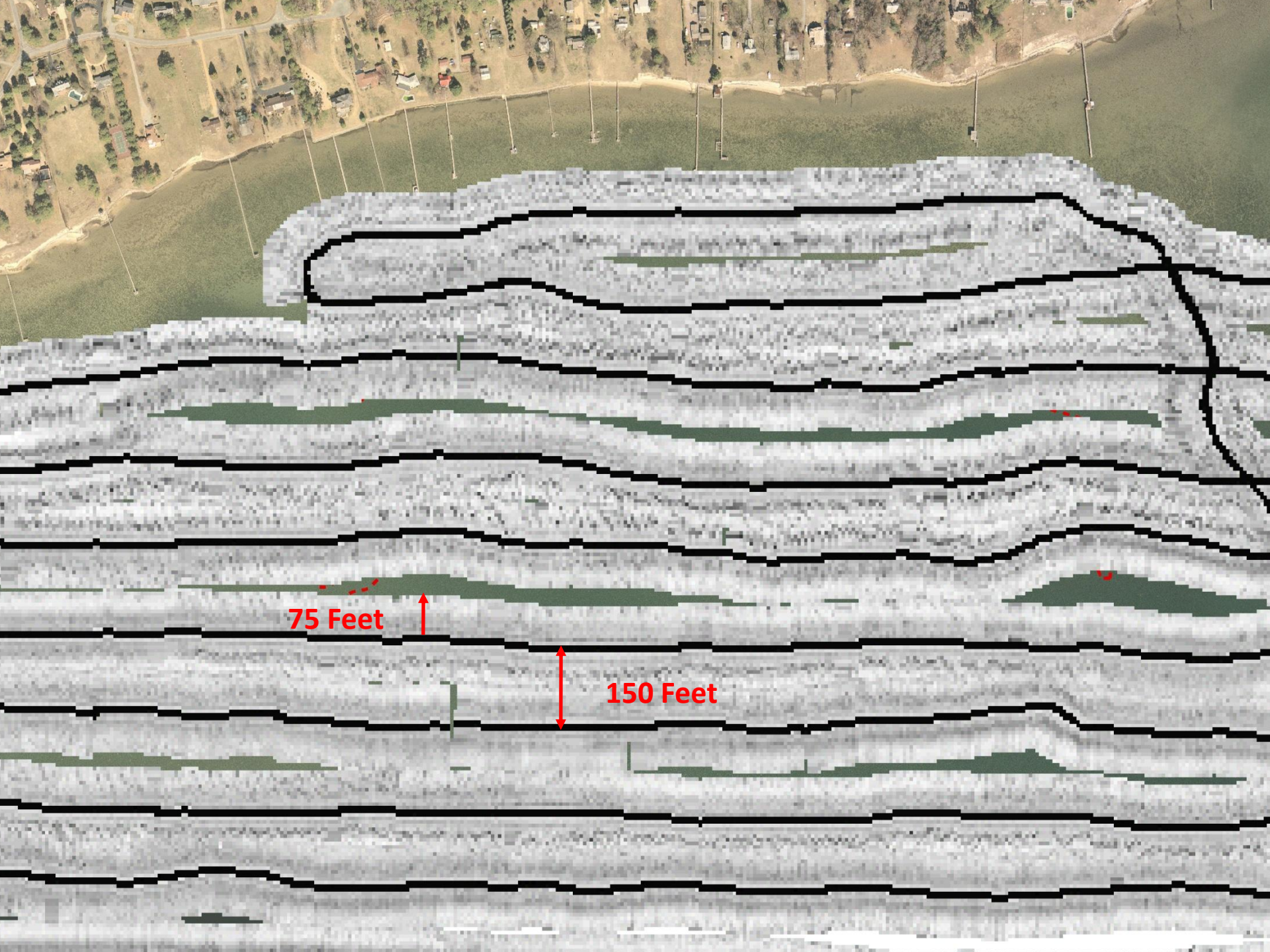
Pilings

Depth	ft	Speed	kts	Course	°t	10:13:43 AM	
<b>6.3</b>		<b>3.8</b>		<b>296</b>		<b>12/04/08</b>	
					N 37.26171°		
					W 076.48399°		



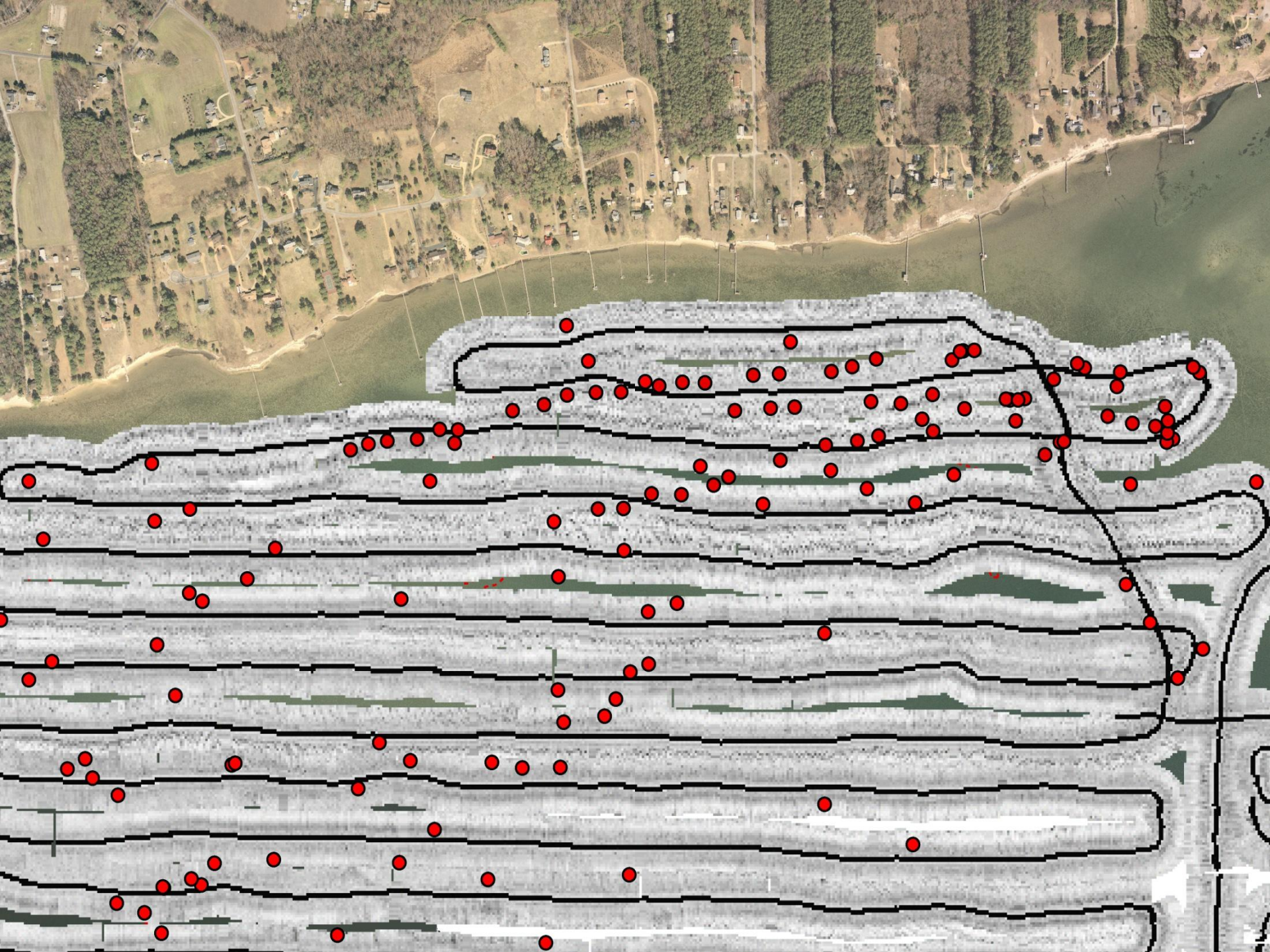
# Survey Techniques



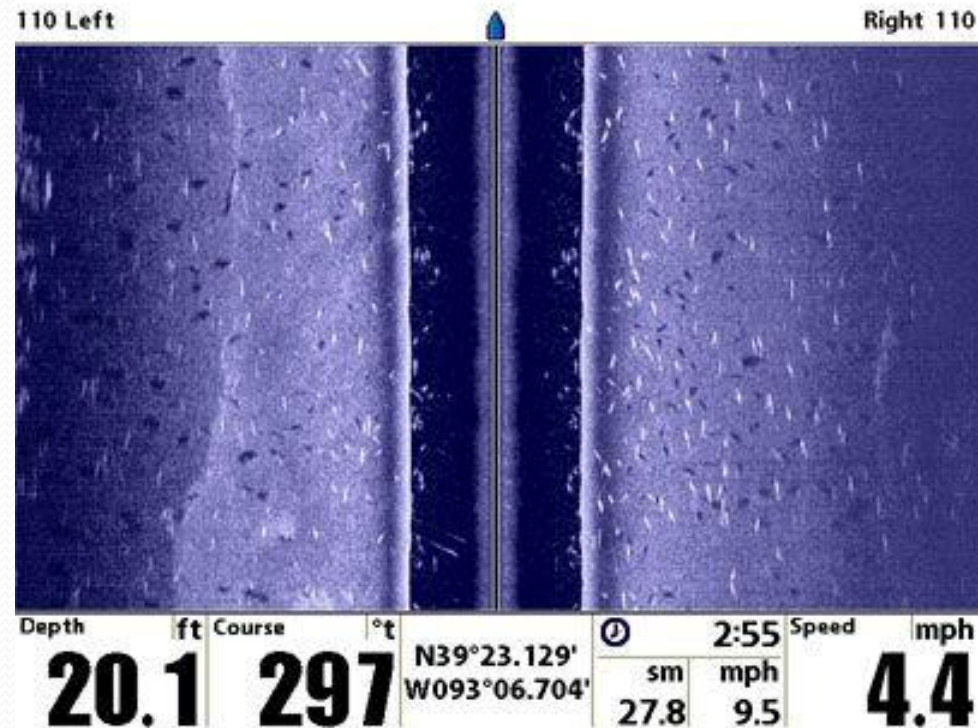
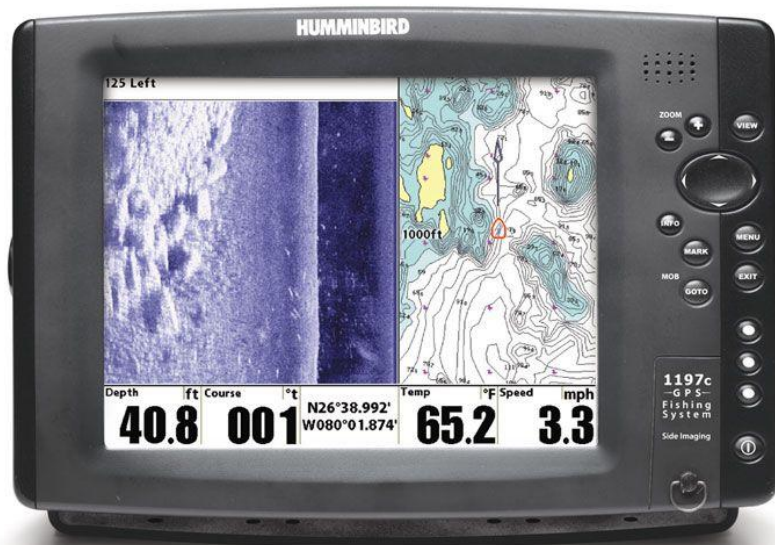


75 Feet

150 Feet



# Humminbird 1197 Side Imaging Unit



# Humminbird Settings

- Single beam set to 200 kHz
- Side scan set to 455 kHz
- Swath width set to 75 feet each side
  
- The unit can hold 3000 way points.
- We will down load the way points.

## Instruction for HUMMINBIRD

### Marking Debris

1. Turn on HUMMINBIRD
2. press “exit” key
3. press quick key #1, to be in side view mode, to mark debris
4. when you see debris push the cursor so the bulls eye is over the object
5. Push the + key to zoom in
6. push the “**mark**” key
7. you must push exit to get back to the side view screen

### At the end of the day to save all data

1. Push the “**menu**” key twice
2. scroll across to the “**NAV**” tab
3. scroll down to “**current track**”
4. scroll across to “**save**”
5. scroll to the right to save and confirm
6. After saving scroll down to “**clear**” and scroll to the right to confirm
7. push the “**exit**” button three times to return to the side view screen
8. hold down the **power** key for two seconds to turn off the HUMMINBIRD

All your way points are automatically saved to the SD card

# Instruction for HUMMINBIRD

## Marking Debris

1. Turn on HUMMINBIRD
2. press “exit“ key
3. press quick key #1, to be in side view mode, to mark debris
4. when you see debris push the cursor so the bulls eye is over the object
5. Push the + key to zoom in
6. push the “**mark**” key
7. you must push exit to get back to the side view screen

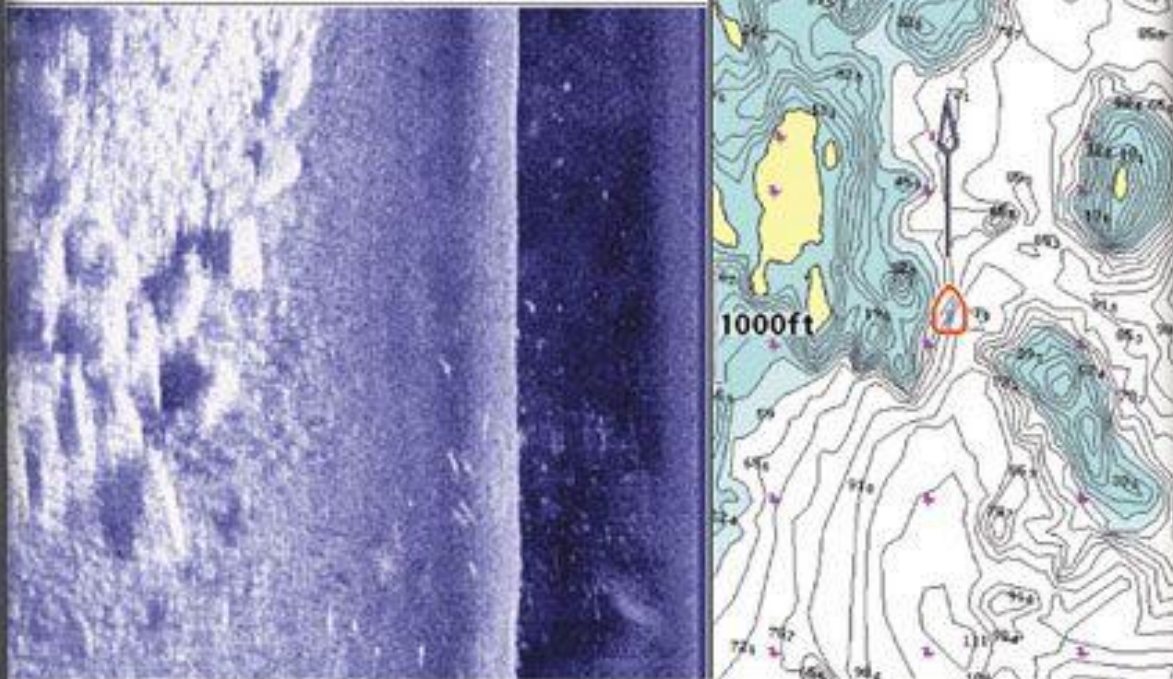
## At the end of the day to save all data

1. Push the “**menu**” key twice
2. scroll across to the “**NAV**” tab
3. scroll down to “**current track**”
4. scroll across to “**save**”
5. scroll to the right to save and confirm
6. After saving scroll down to “**clear**” and scroll to the right to confirm
7. push the “**exit**” button three times to return to the side view screen
8. hold down the **power** key for two seconds to turn off the HUMMINBIRD

All your way points are automatically saved to the SD card

HUMMINBIRD

125 Left



Depth	ft	Course	°t	Temp	°F	Speed	mph
<b>40.8</b>		<b>001</b>		<b>65.2</b>		<b>3.3</b>	
N26°38.992'				W080°01.874'			

ZOOM



VIEW



INFO

MARK

MENU

MOB

GOTO

EXIT

1197c  
-GPS-  
Fishing  
System

Side Imaging



## Instruction for HUMMINBIRD

### Marking Debris

1. Turn on HUMMINBIRD
2. press “exit” key
3. press quick key #1, to be in side view mode, to mark debris
4. when you see debris push the cursor so the bulls eye is over the object
5. Push the + key to zoom in
6. push the “mark” key
7. you must push exit to get back to the side view screen

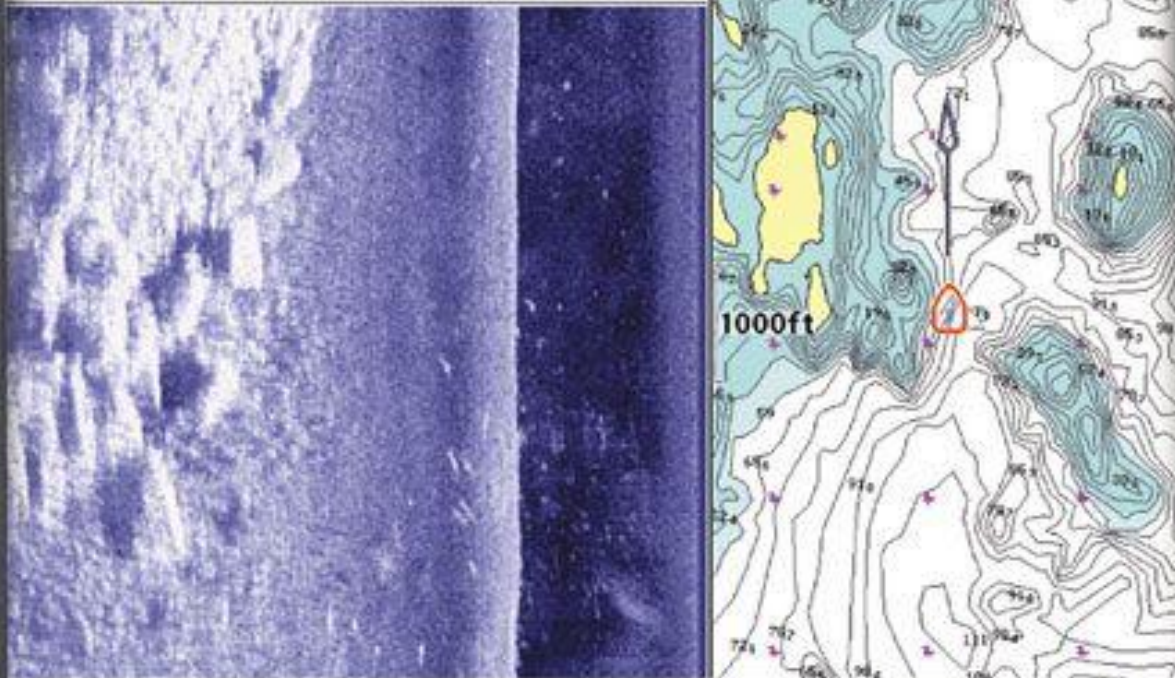
### At the end of the day to save all data

1. Push the “menu” key twice
2. scroll across to the “NAV” tab
3. scroll down to “current track”
4. scroll across to “save”
5. scroll to the right to save and confirm
6. After saving scroll down to “clear” and scroll to the right to confirm
7. push the “exit” button three times to return to the side view screen
8. hold down the power key for two seconds to turn off the HUMMINBIRD

All your way points are automatically saved to the SD card

HUMMINBIRD

125 Left



Depth	ft	Course	°t	Temp	°F	Speed	mph
<b>40.8</b>		<b>001</b>		<b>65.2</b>		<b>3.3</b>	
N26°38.992'				W080°01.874'			

ZOOM

VIEW

INFO

MARK

MOB

GOTO

EXIT

1197c  
-GPS-  
Fishing  
System

Side Imaging

Power button

## Instruction for HUMMINBIRD

### Marking Debris

1. Turn on HUMMINBIRD
2. press “exit” key
3. press quick key #1, to be in side view mode, to mark debris
4. when you see debris push the cursor so the bulls eye is over the object
5. Push the + key to zoom in
6. push the “**mark**” key
7. you must push exit to get back to the side view screen

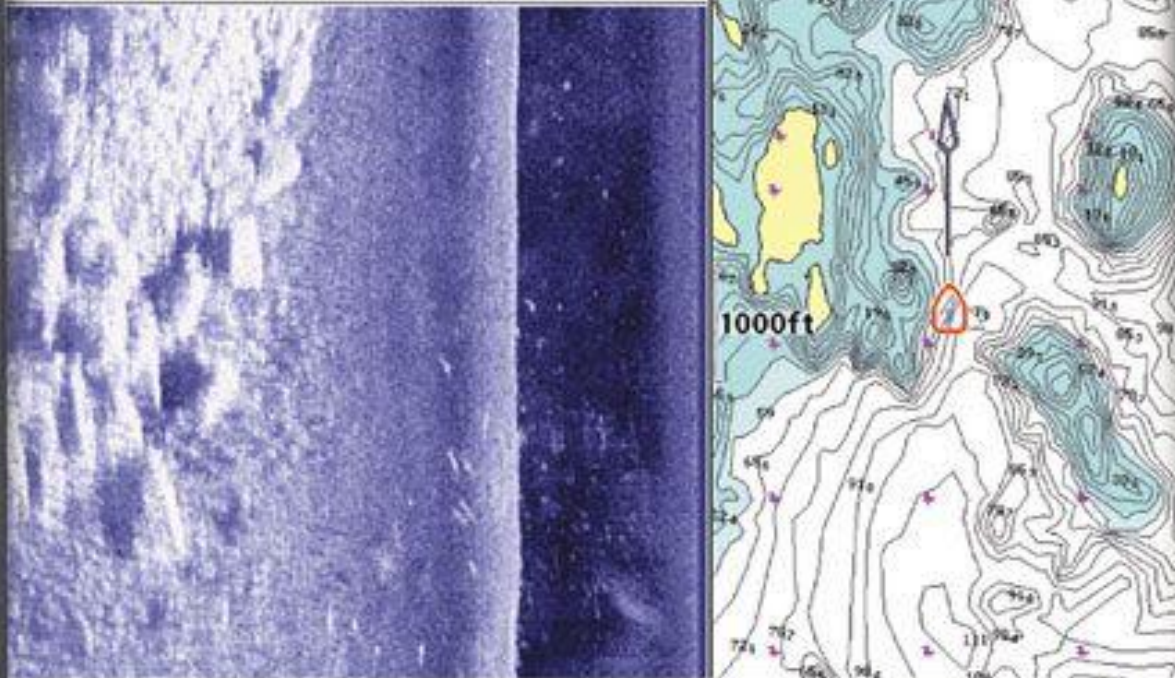
### At the end of the day to save all data

1. Push the “**menu**” key twice
2. scroll across to the “**NAV**” tab
3. scroll down to “**current track**”
4. scroll across to “**save**”
5. scroll to the right to save and confirm
6. After saving scroll down to “**clear**” and scroll to the right to confirm
7. push the “**exit**” button three times to return to the side view screen
8. hold down the **power** key for two seconds to turn off the HUMMINBIRD

All your way points are automatically saved to the SD card

HUMMINBIRD

125 Left



Depth	ft	Course	°t	Temp	°F	Speed	mph
40.8	001	N26°38.992'	W080°01.874'	65.2	3.3		

ZOOM



VIEW



INFO

MARK

MENU

MOB

GOTO

EXIT



1197c  
-GPS-  
Fishing  
System

Side Imaging



## Instruction for HUMMINBIRD

### Marking Debris

1. Turn on HUMMINBIRD
2. press “exit” key
3. press quick key #1, to be in side view mode, to mark debris
4. when you see debris push the cursor so the bulls eye is over the object
5. Push the + key to zoom in
6. push the “**mark**” key
7. you must push exit to get back to the side view screen

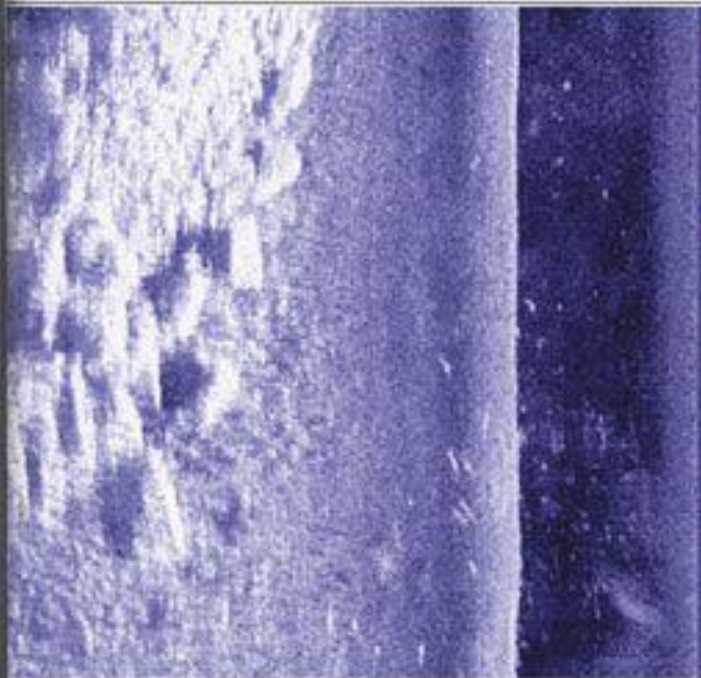
### At the end of the day to save all data

1. Push the “**menu**” key twice
2. scroll across to the “**NAV**” tab
3. scroll down to “**current track**”
4. scroll across to “**save**”
5. scroll to the right to save and confirm
6. After saving scroll down to “**clear**” and scroll to the right to confirm
7. push the “**exit**” button three times to return to the side view screen
8. hold down the **power** key for two seconds to turn off the HUMMINBIRD

All your way points are automatically saved to the SD card

HUMMINBIRD

125 Left



Depth	ft	Course	°t	Temp	°F	Speed	mph
<b>40.8</b>		<b>001</b>		<b>65.2</b>		<b>3.3</b>	
N26°38.992'				W080°01.874'			

ZOOM



VIEW



INFO

MARK

MENU

MOB

GOTO

EXIT

1197c  
-GPS-  
Fishing  
System

Side Imaging





**60.1** ft

Cursor

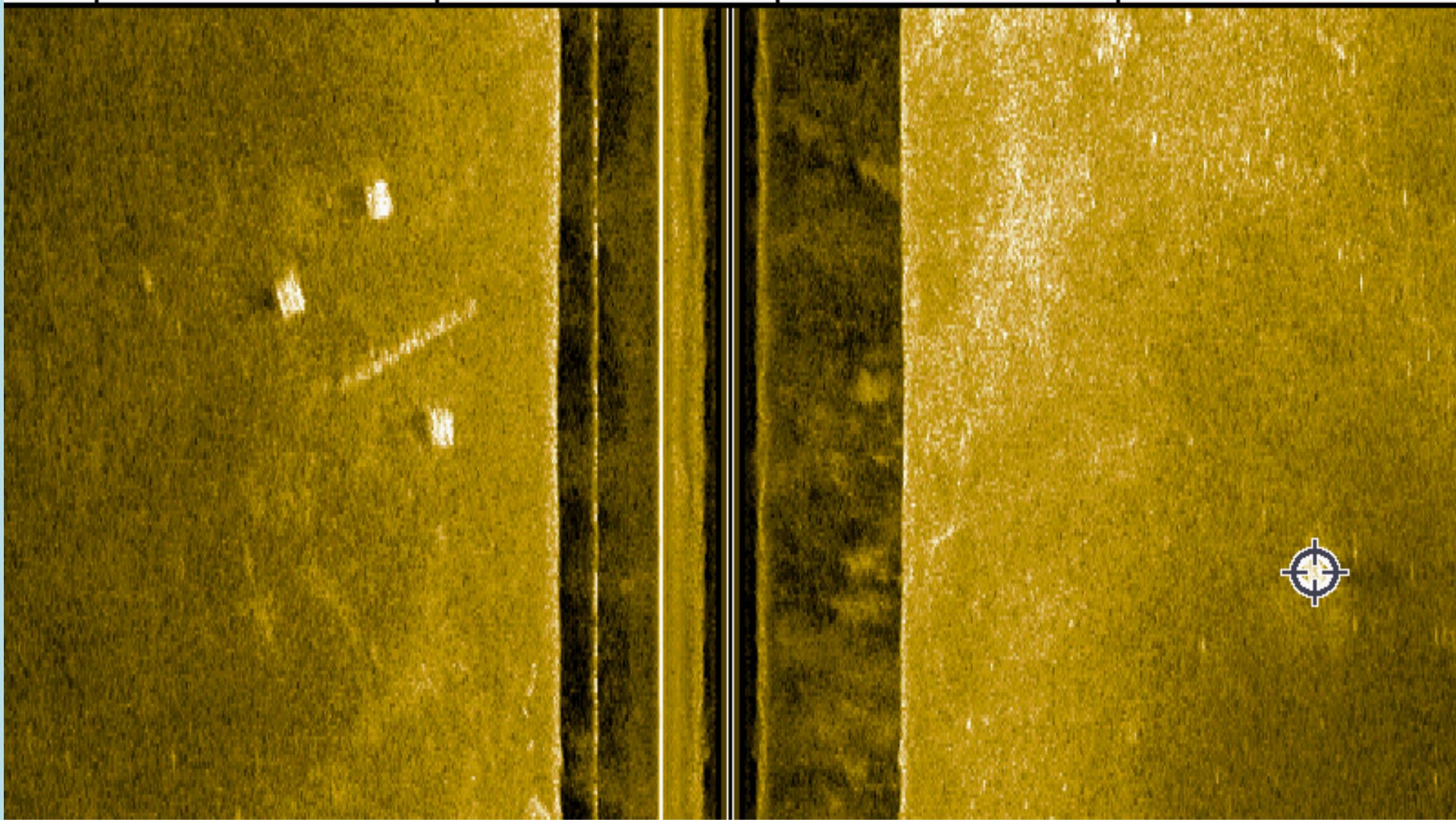
Depth

**336** ft

Distance

**345** °t

Bearing



Depth	ft	Speed	kts	Course	°t		
<b>16.6</b>		<b>4.4</b>		<b>074</b>		N 37.82978°	<b>12:21:45 PM</b>
						W 076.28154°	<b>12/22/08</b>

## Instruction for HUMMINBIRD

### Marking Debris

1. Turn on HUMMINBIRD
2. press “exit” key
3. press quick key #1, to be in side view mode, to mark debris
4. when you see debris push the cursor so the bulls eye is over the object
5. Push the + key to zoom in
6. push the “mark” key
7. you must push exit to get back to the side view screen

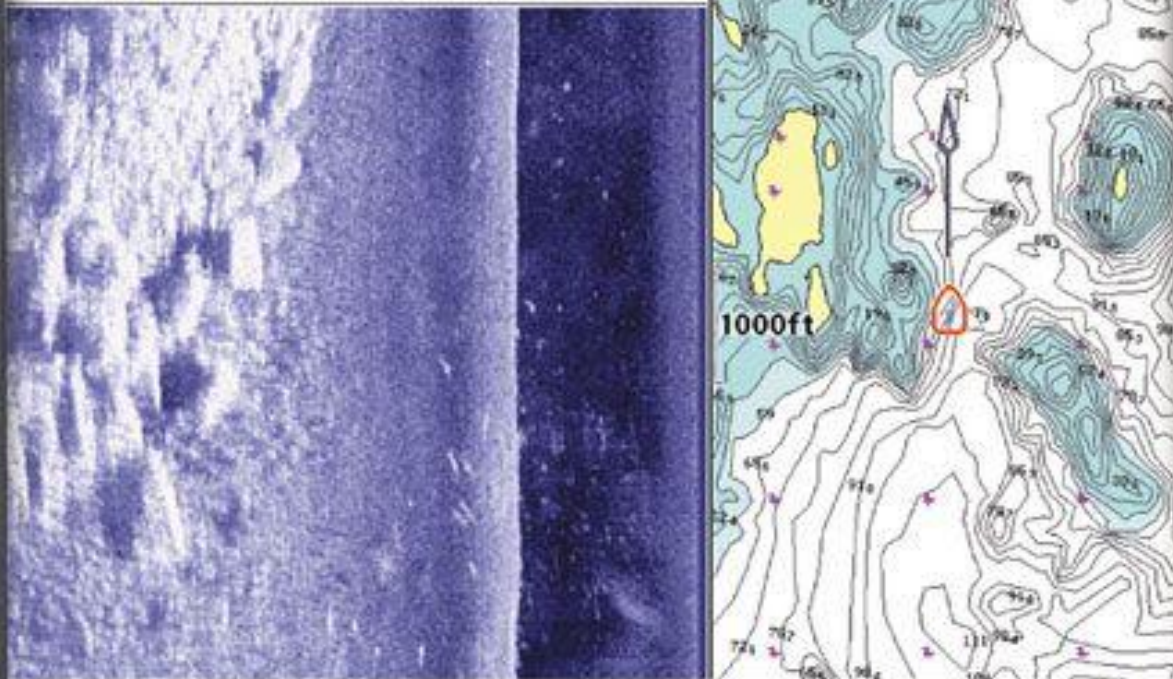
### At the end of the day to save all data

1. Push the “menu” key twice
2. scroll across to the “NAV” tab
3. scroll down to “current track”
4. scroll across to “save”
5. scroll to the right to save and confirm
6. After saving scroll down to “clear” and scroll to the right to confirm
7. push the “exit” button three times to return to the side view screen
8. hold down the power key for two seconds to turn off the HUMMINBIRD

All your way points are automatically saved to the SD card

HUMMINBIRD

125 Left



Depth	ft	Course	°t	Temp	°F	Speed	mph
<b>40.8</b>		<b>001</b>		<b>65.2</b>		<b>3.3</b>	
N26°38.992'				W080°01.874'			

ZOOM



VIEW

INFO

MARK

MOB

GOTO

MENU

EXIT

1197c  
—GPS—  
Fishing  
System

Side Imaging





**35.9**ft

Cursor

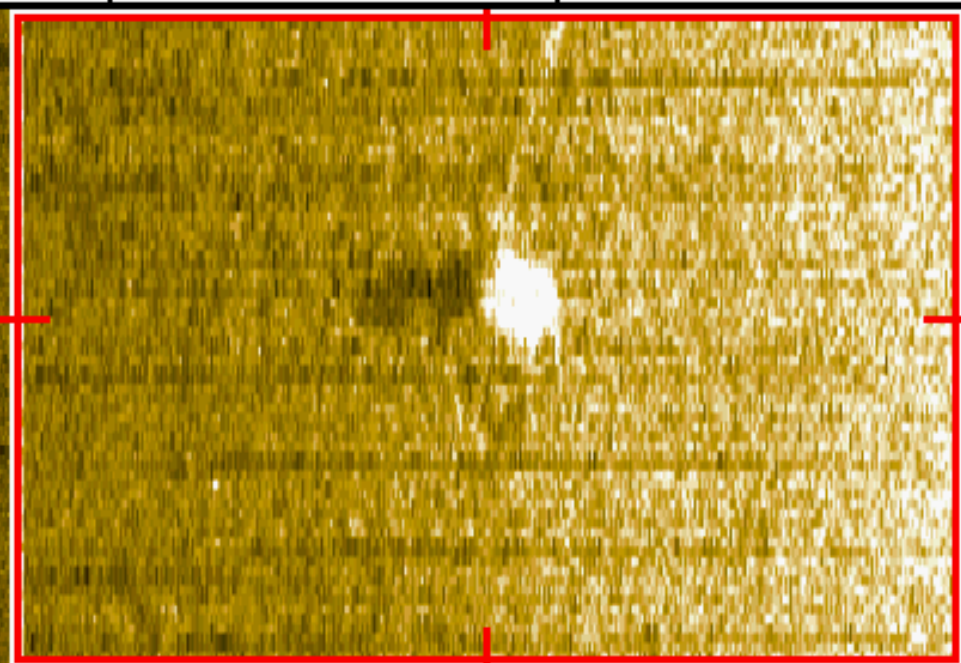
Depth

**162**ft

Distance

BRG 151°t

Zoom 2x



Depth	ft	Speed	kts	Course	°t		
<b>13.2</b>		<b>6.5</b>		<b>331</b>		N 37.31065°	8:07:36 AM
						W 076.60654°	12/30/08

# Instruction for HUMMINBIRD

## Marking Debris

1. Turn on HUMMINBIRD
2. press “exit“ key
3. press quick key #1, to be in side view mode, to mark debris
4. when you see debris push the cursor so the bulls eye is over the object
5. Push the + key to zoom in
6. push the “mark” key
7. you must push exit to get back to the side view screen

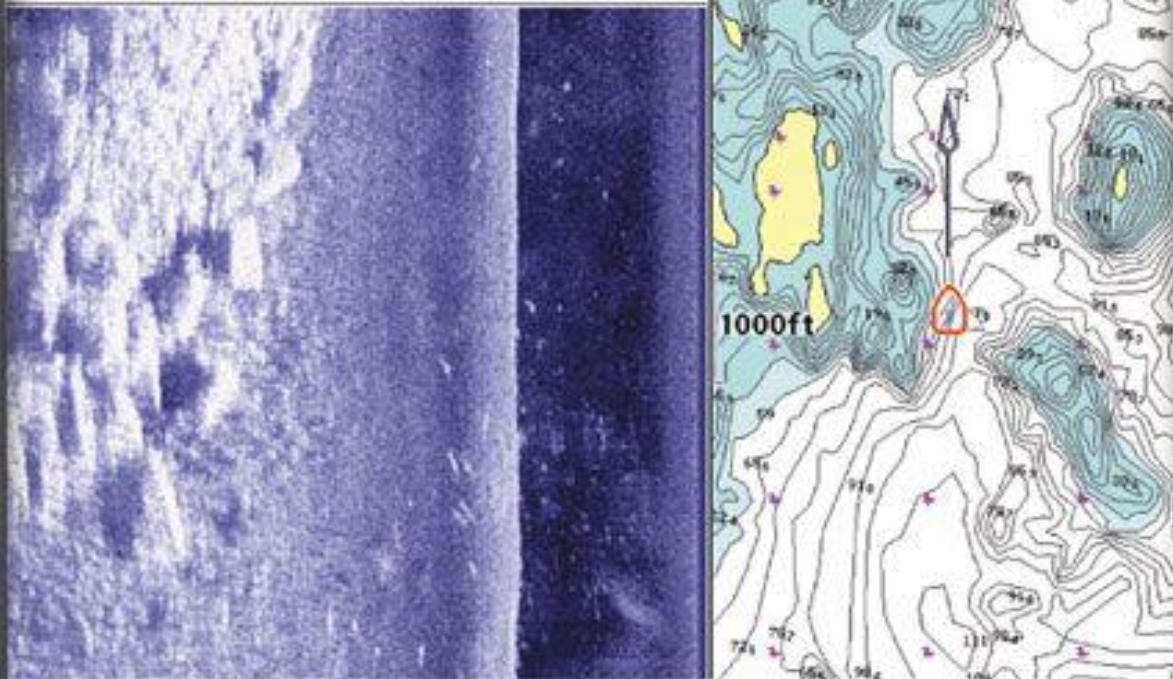
## At the end of the day to save all data

1. Push the “menu” key twice
2. scroll across to the “NAV” tab
3. scroll down to “current track”
4. scroll across to “save”
5. scroll to the right to save and confirm
6. After saving scroll down to “clear” and scroll to the right to confirm
7. push the “exit” button three times to return to the side view screen
8. hold down the power key for two seconds to turn off the HUMMINBIRD

All your way points are automatically saved to the SD card

HUMMINBIRD

125 Left



Depth	ft	Course	°t	Temp	°F	Speed	mph
40.8	001	N26°38.992'	W080°01.874'	65.2	3.3		

ZOOM

VIEW

INFO

MARK

MENU

MIR

EXIT

GOTO

1197c  
—GPS—  
Fishing  
System

Side Imaging



# Instruction for HUMMINBIRD

## Marking Debris

1. Turn on HUMMINBIRD
2. press “exit” key
3. press quick key #1, to be in side view mode, to mark debris
4. when you see debris push the cursor so the bulls eye is over the object
5. Push the + key to zoom in
6. push the “**mark**” key
7. you must push exit to get back to the side view screen

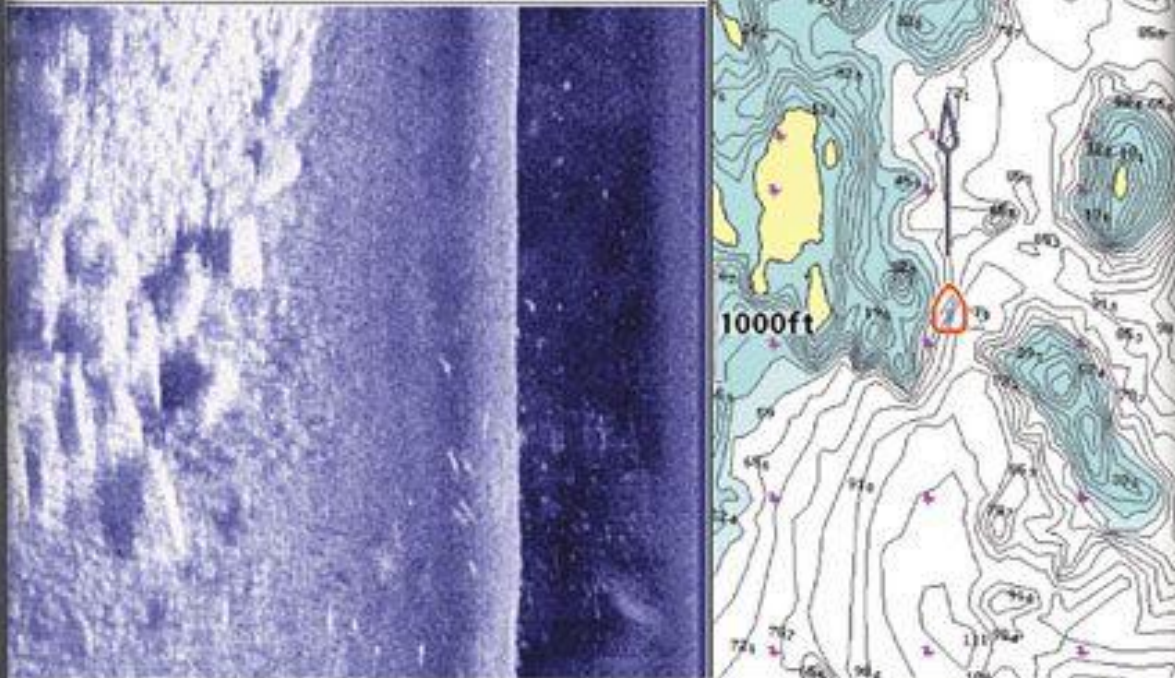
## At the end of the day to save all data

1. Push the “**menu**” key twice
2. scroll across to the “**NAV**” tab
3. scroll down to “**current track**”
4. scroll across to “**save**”
5. scroll to the right to save and confirm
6. After saving scroll down to “**clear**” and scroll to the right to confirm
7. push the “**exit**” button three times to return to the side view screen
8. hold down the **power** key for two seconds to turn off the HUMMINBIRD

All your way points are automatically saved to the SD card

HUMMINBIRD

125 Left



Depth	ft	Course	°t	Temp	°F	Speed	mph
40.8		001		65.2		3.3	

ZOOM

VIEW

INFO

MARK

MOB

GOTO

VIEW

MENU

EXIT

1197c  
-GPS-  
Fishing  
System

Side Imaging

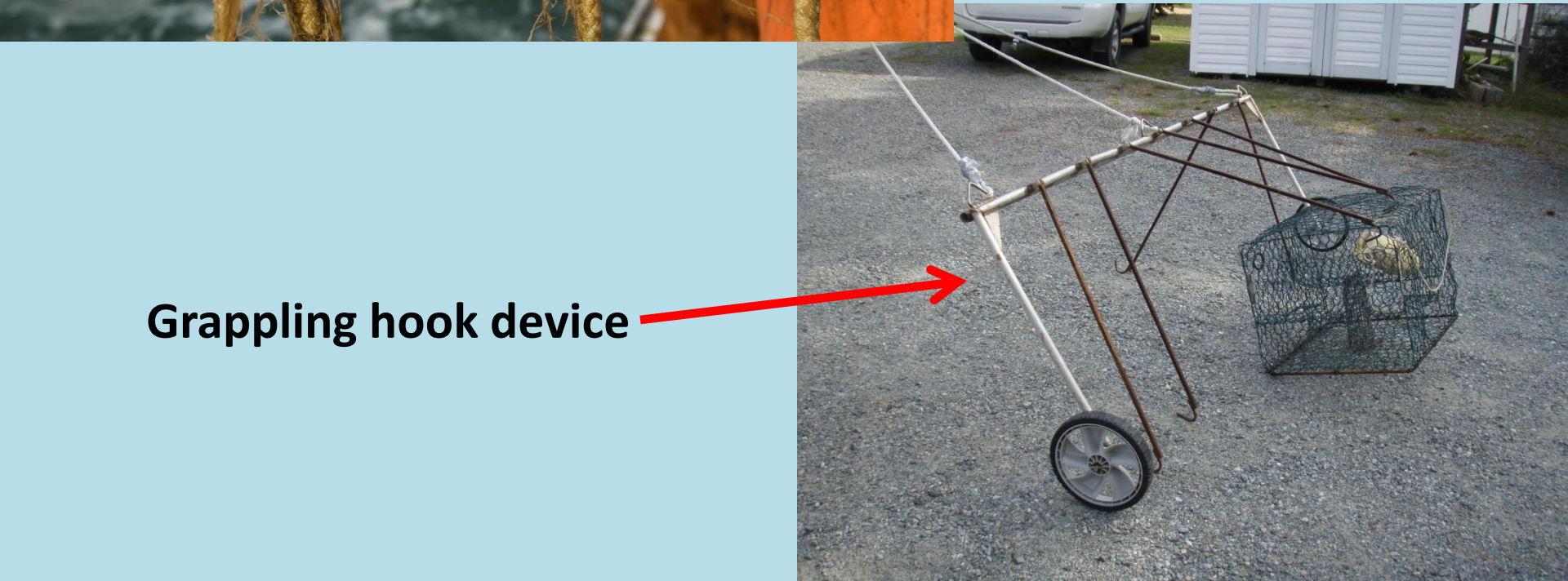
Power button

# Retrieval of Marine Debris

- Once the debris has been marked and a Lat. Long. has been saved. You can use the “goto feature on the Humminbird to drive to the exact spot and use the grappling device to retrieve the object.



**Dragline**



**Grappling hook device**



# Removal and Disposal of Marine Debris

- Go to waypoint marking the unknown object
- Drag the grappling device through the area
- Record contents
- Dispose at dump or recycle if able

## Instruction for HUMMINBIRD

### Marking Debris

1. Turn on HUMMINBIRD
2. press “exit” key
3. press quick key #1, to be in side view mode, to mark debris
4. when you see debris push the cursor so the bulls eye is over the object
5. Push the + key to zoom in
6. push the “**mark**” key
7. you must push exit to get back to the side view screen

### At the end of the day to save all data

1. Push the “**menu**” key twice
2. scroll across to the “**NAV**” tab
3. scroll down to “**current track**”
4. scroll across to “**save**”
5. scroll to the right to save and confirm
6. After saving scroll down to “**clear**” and scroll to the right to confirm
7. push the “**exit**” button three times to return to the side view screen
8. hold down the **power** key for two seconds to turn off the HUMMINBIRD

All your way points are automatically saved to the SD card

# Removable Transducer Mount



- 2 inch Aluminum channel stock or square stock
- GPS should be mounted directly above the transducer and above any interference
- Transducer should not be mounted within any prop wash



# The Prop Method

Not a good way to pick up pots

