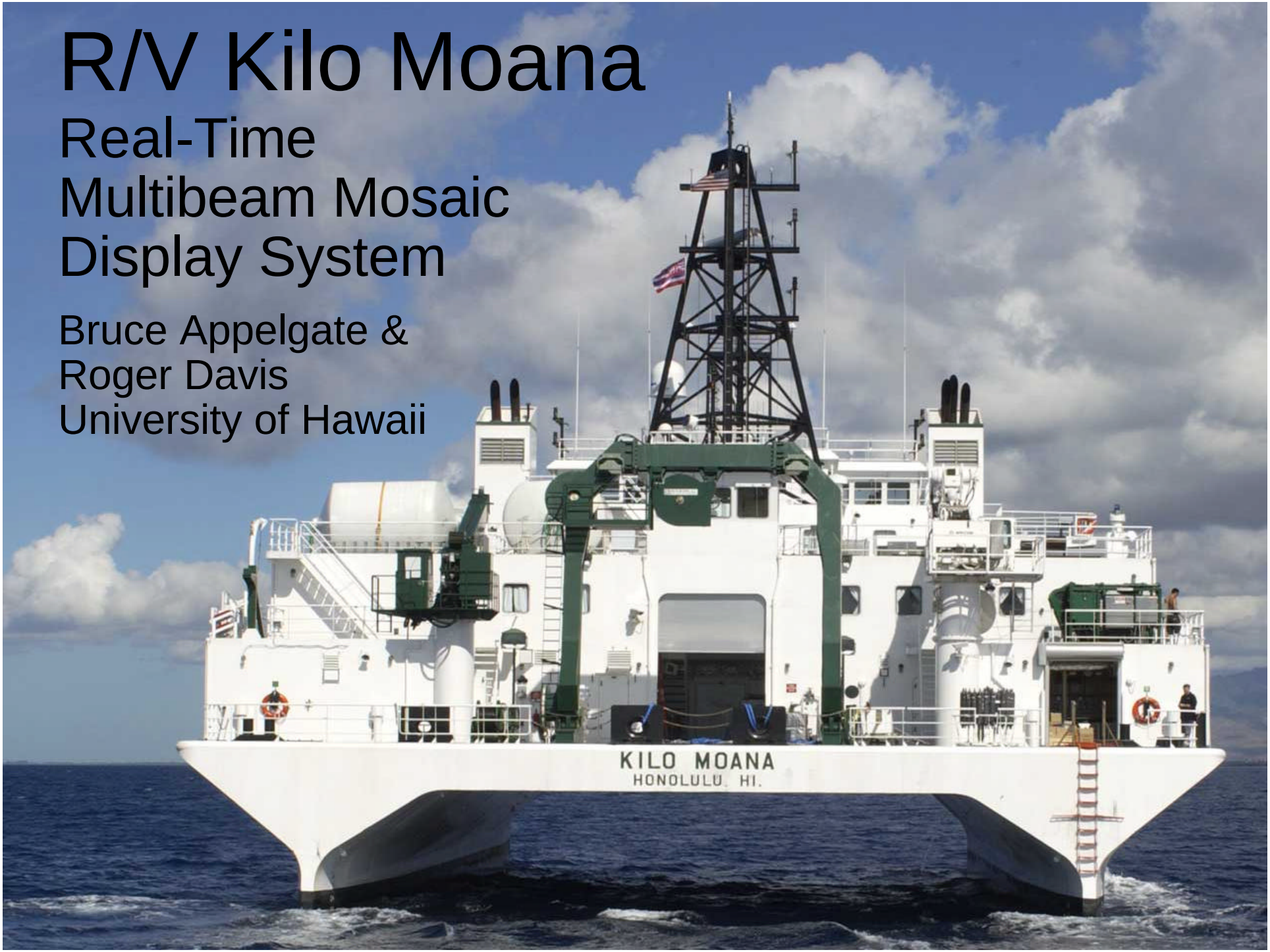
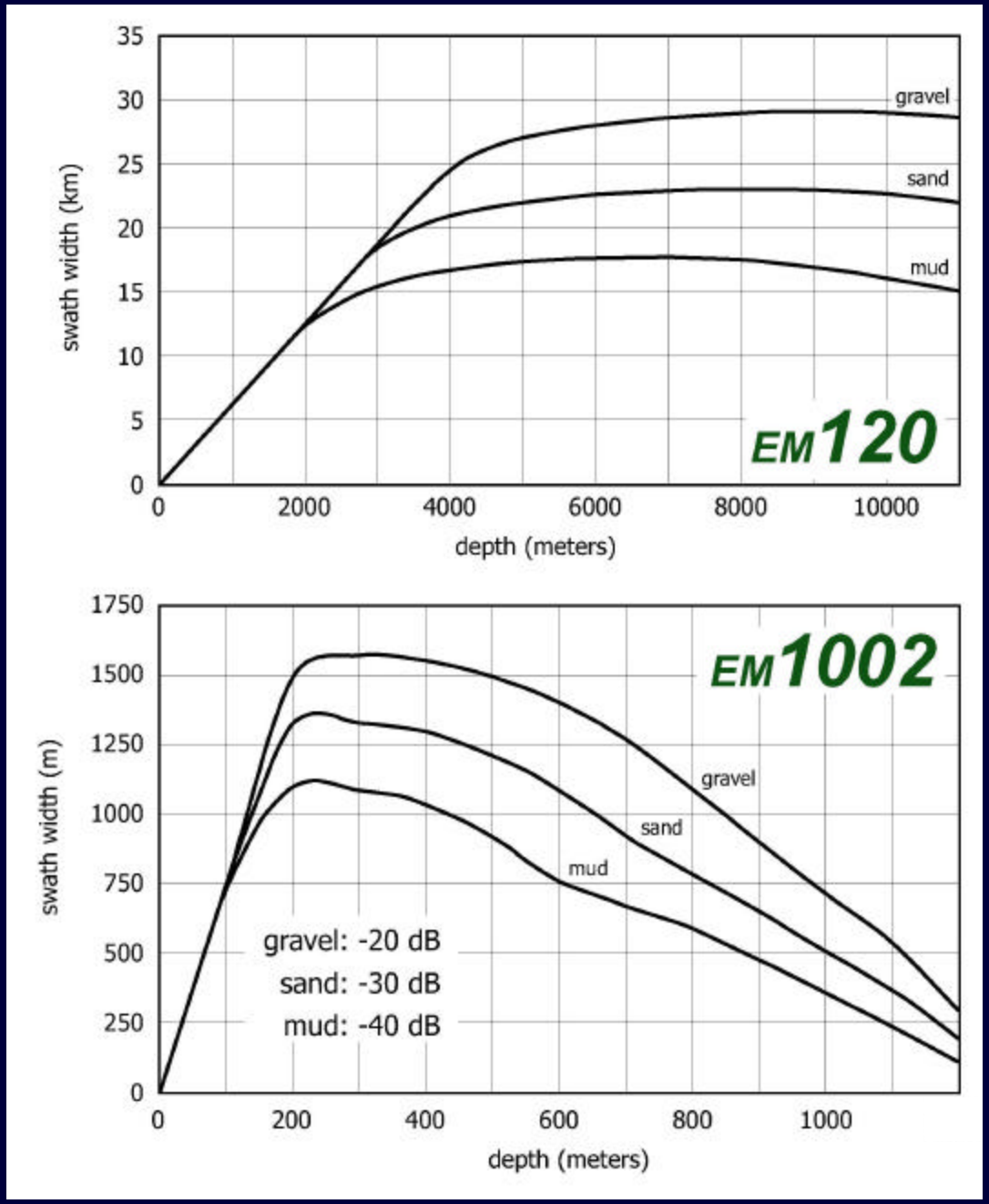
R/V Kilo Moana

Real-Time Multibeam Mosaic Display System

Bruce Appelgate &
Roger Davis
University of Hawaii



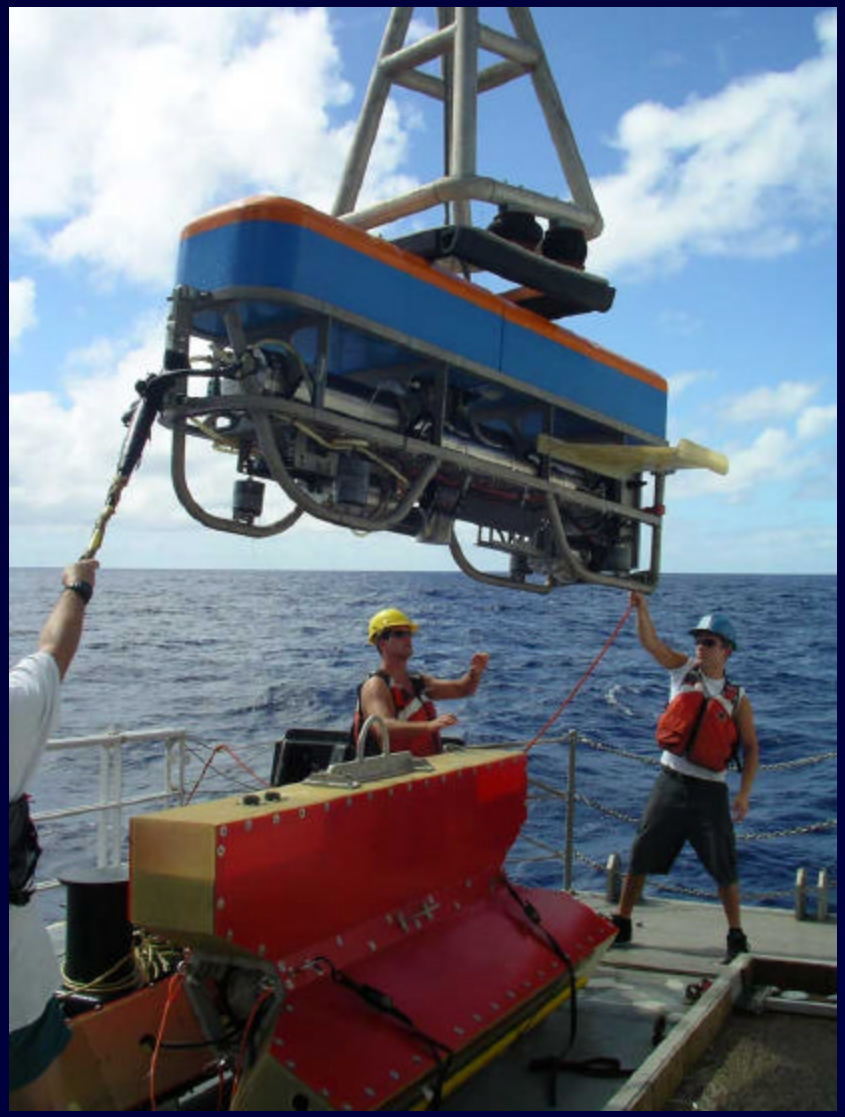


Dual multibeams

- em1002 (~95 kHz, 0-800 m)
- em120 (~12 kHz, 500+ m)
- 150° swath, weather-tolerant

Multibeam acquisition

Using acquisition workstations for survey display & planning: not good



DSL-120A & IMI-30
aboard *Kilo Moana* April, 2004

HMRG Software

Created for towed SSBS sonars

SeaMARC II, HAWAII MR1, SEAMAP, DSL-120A, IMI-30, IMI-12

Processing and charting software for bathymetry and sidescan data

HMRG Software

Modified to process hull-mounted multibeam imagery

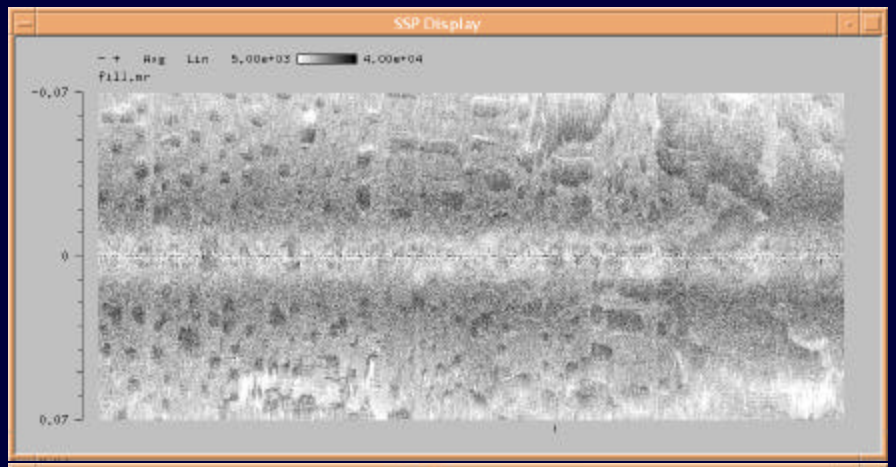
Simrad em120, em1002, em300, em3000, Reson 8101, Sea Beam 2000, 2112

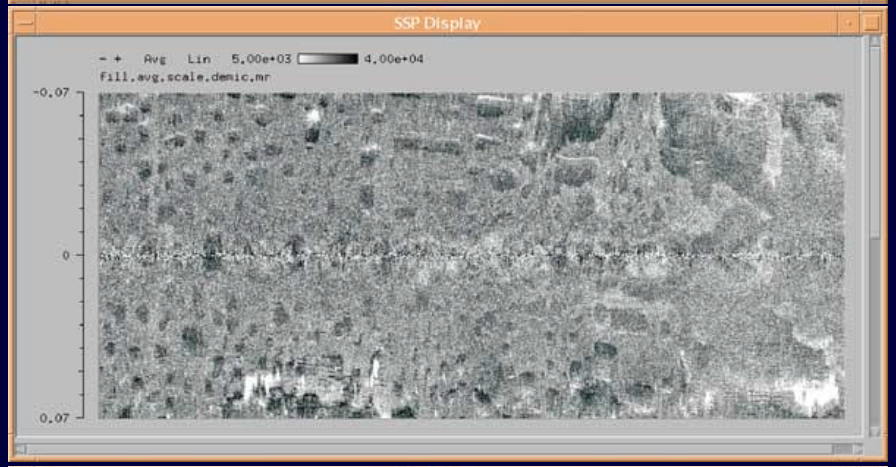
AHI

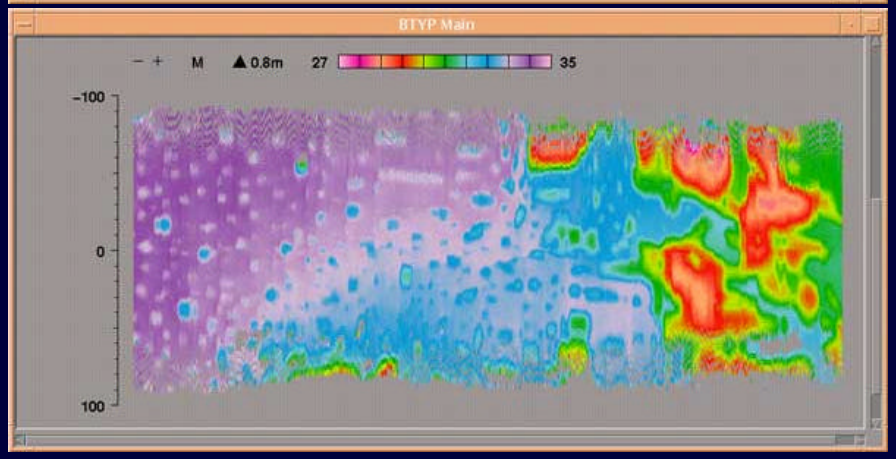
Healy

Thompson

Hi`ialakai







Initial Goal

• To view chart-like display of multibeam bathymetry and backscatter in real time, separate from acquisition system.

Mission Creep

• Do all kinds of stuff programmer didn’t initially agree to: pan, zoom, change color lookup tables, flip grayscale polarity, autoscroll, survey planning.

Future Plans

• More robust survey planning (waypoint export/import)

• Helm display for better communication with bridge

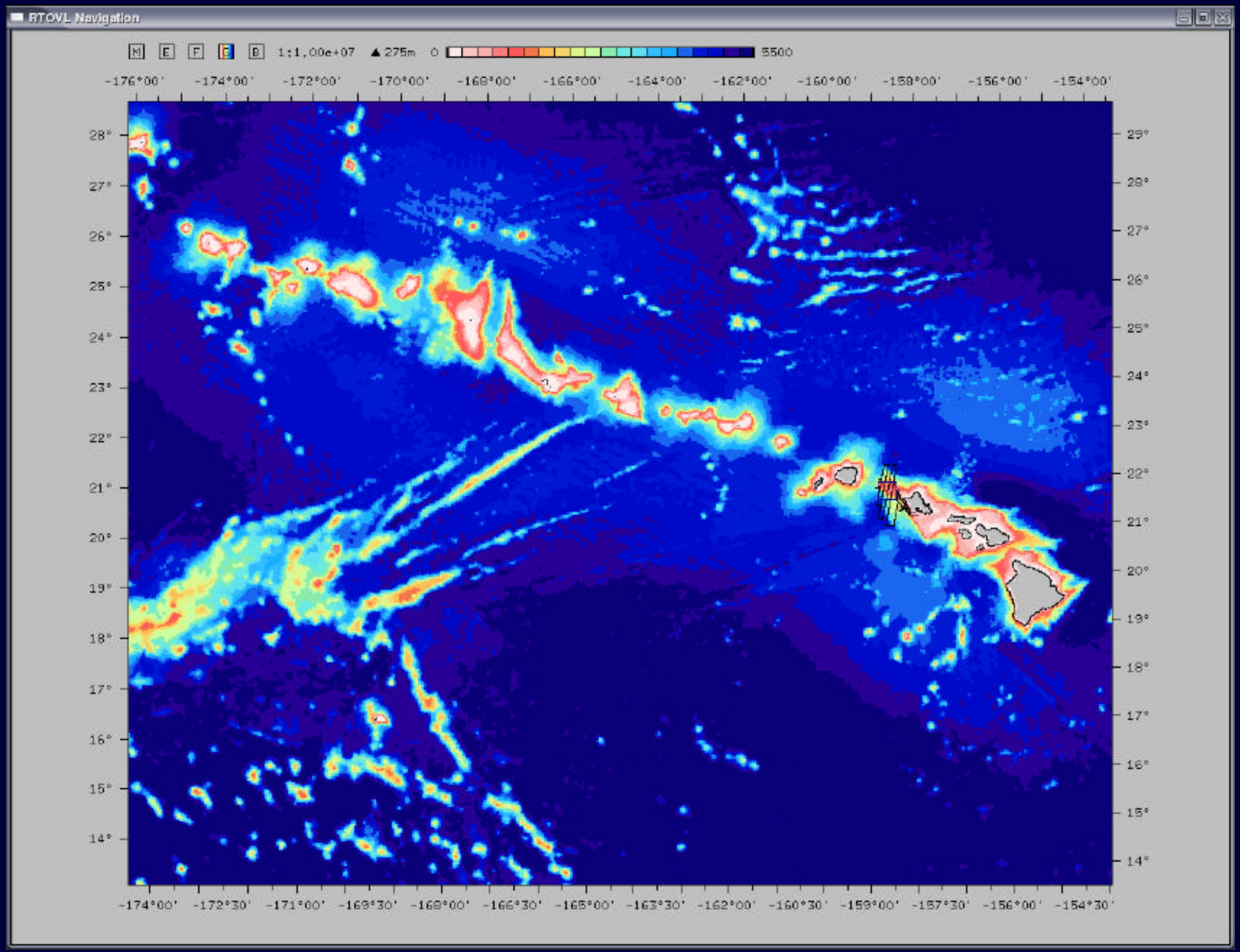
Conclusion

It works.

How it works

- Raw data acquired & logged normally
- Data periodically transferred to mosaic computer
- Bathymetry & backscatter are gridded at 3 resolutions
- Gridded data are incorporated into mosaic display
- Based on existing HMRG software for bathy/sidescan processing and mosaic display
- Because the mosaic display is separate from the data acquisition system, if bad things* happen to the mosaic display, data acquisition is not adversely affected.

* bad things never happen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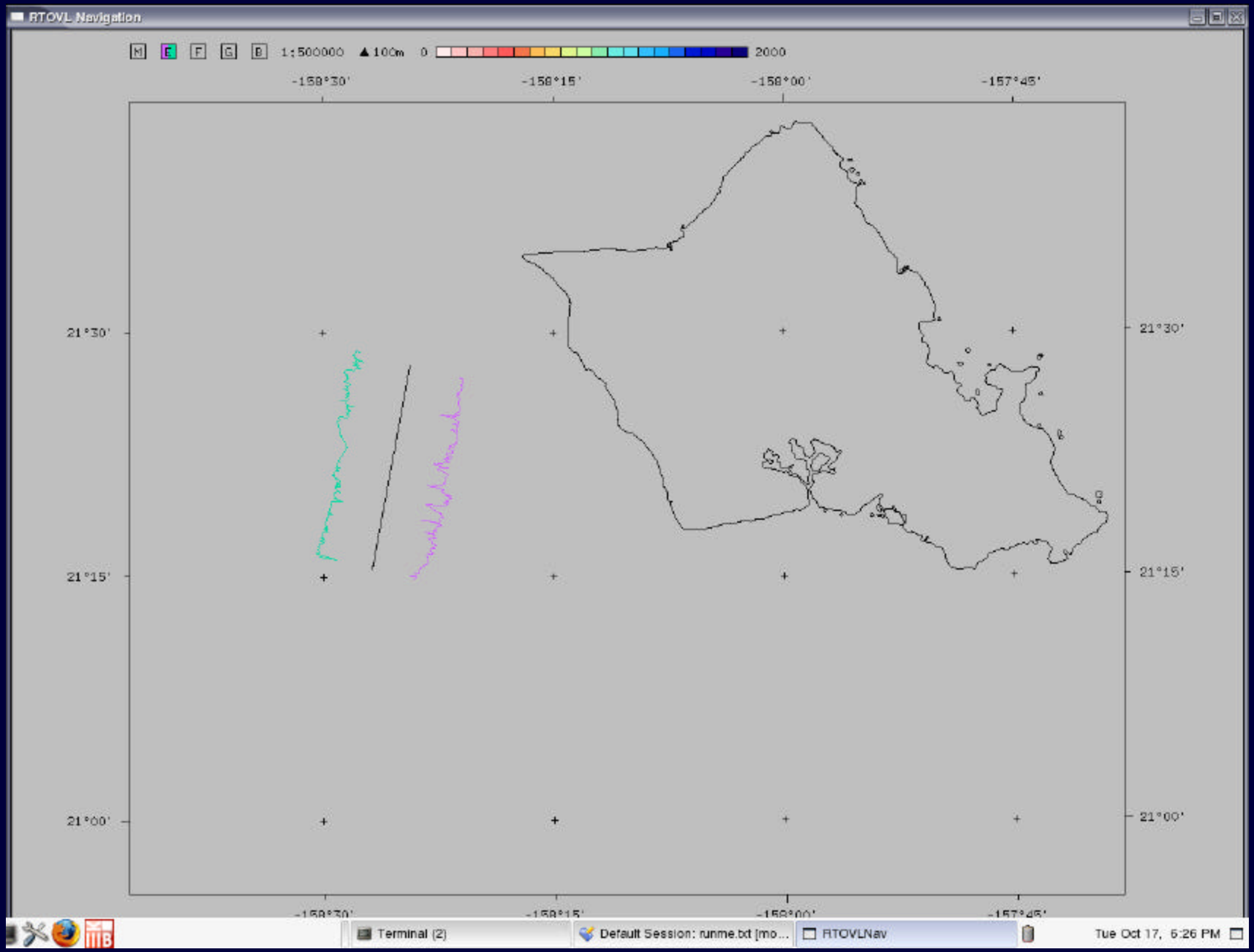
28° 27° 26° 25° 24° 23° 22° 21° 20° 19° 18° 17° 16° 15° 14°
-174°00' -172°30' -171°00' -169°30' -168°00' -166°30' -165°00' -163°30' -162°00' -160°30' -159°00' -157°30' -156°00' -154°30'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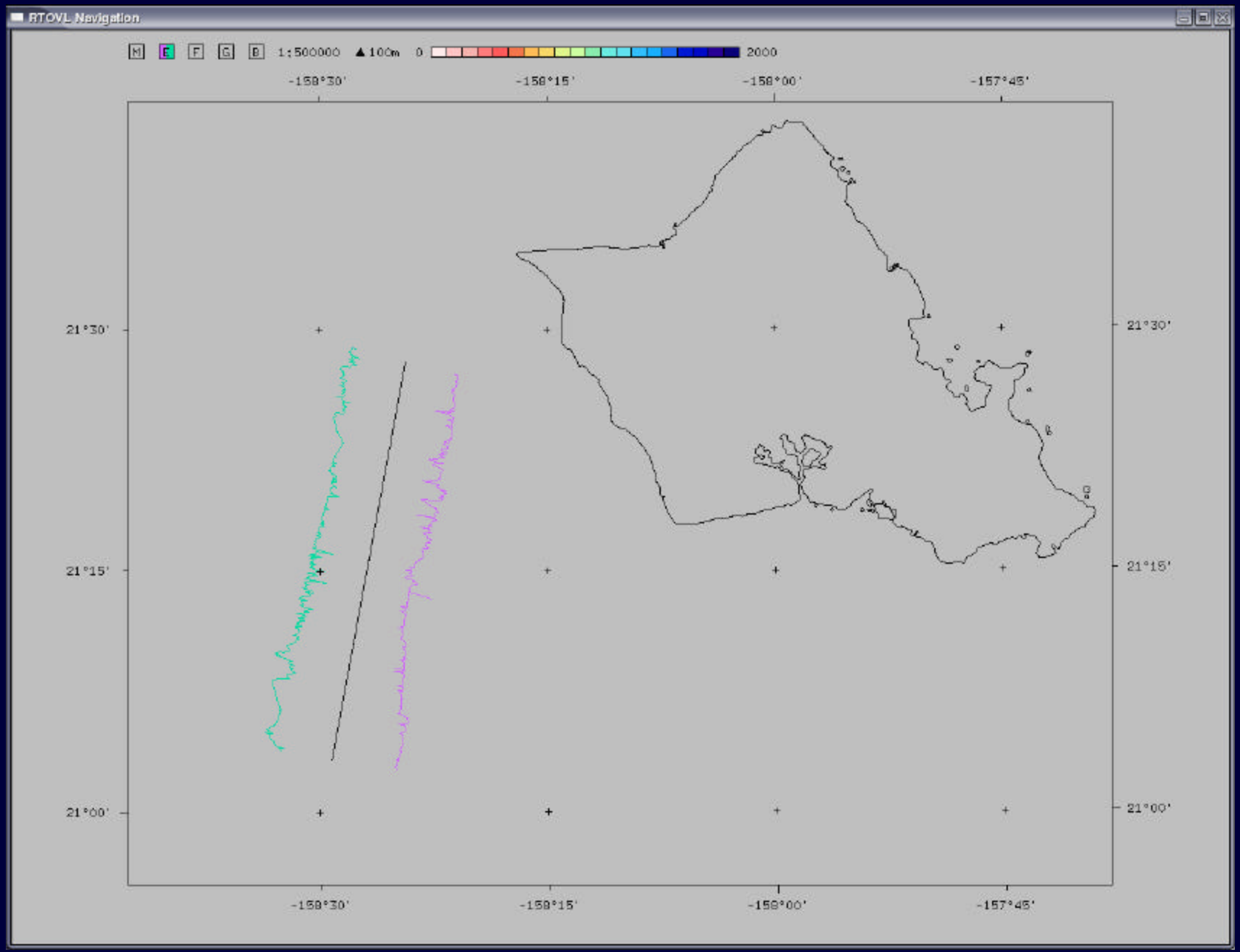
Terminal (2)
Default Session: runme.txt [mo...
RTOVLNav
Tue Oct 17, 6:26 PM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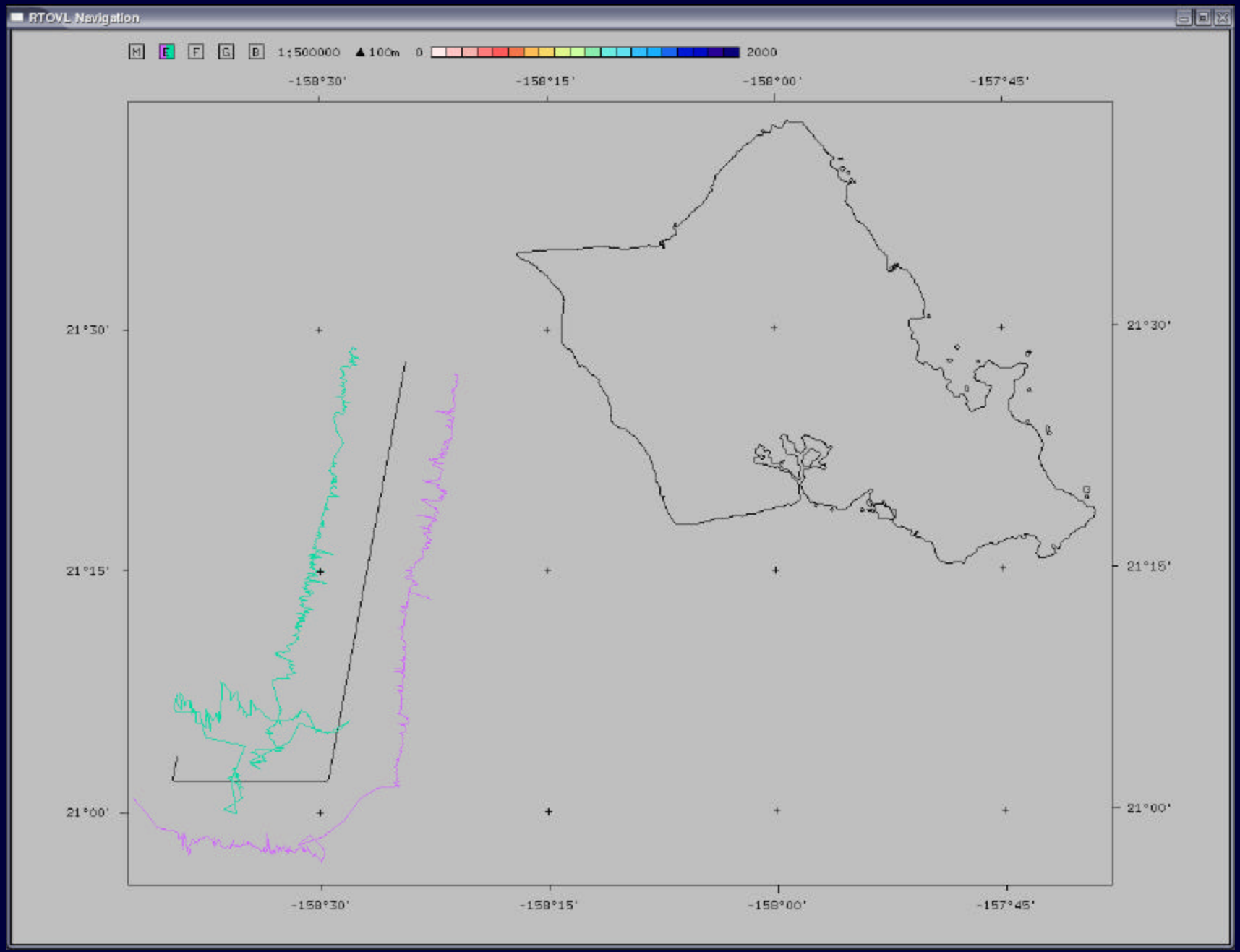
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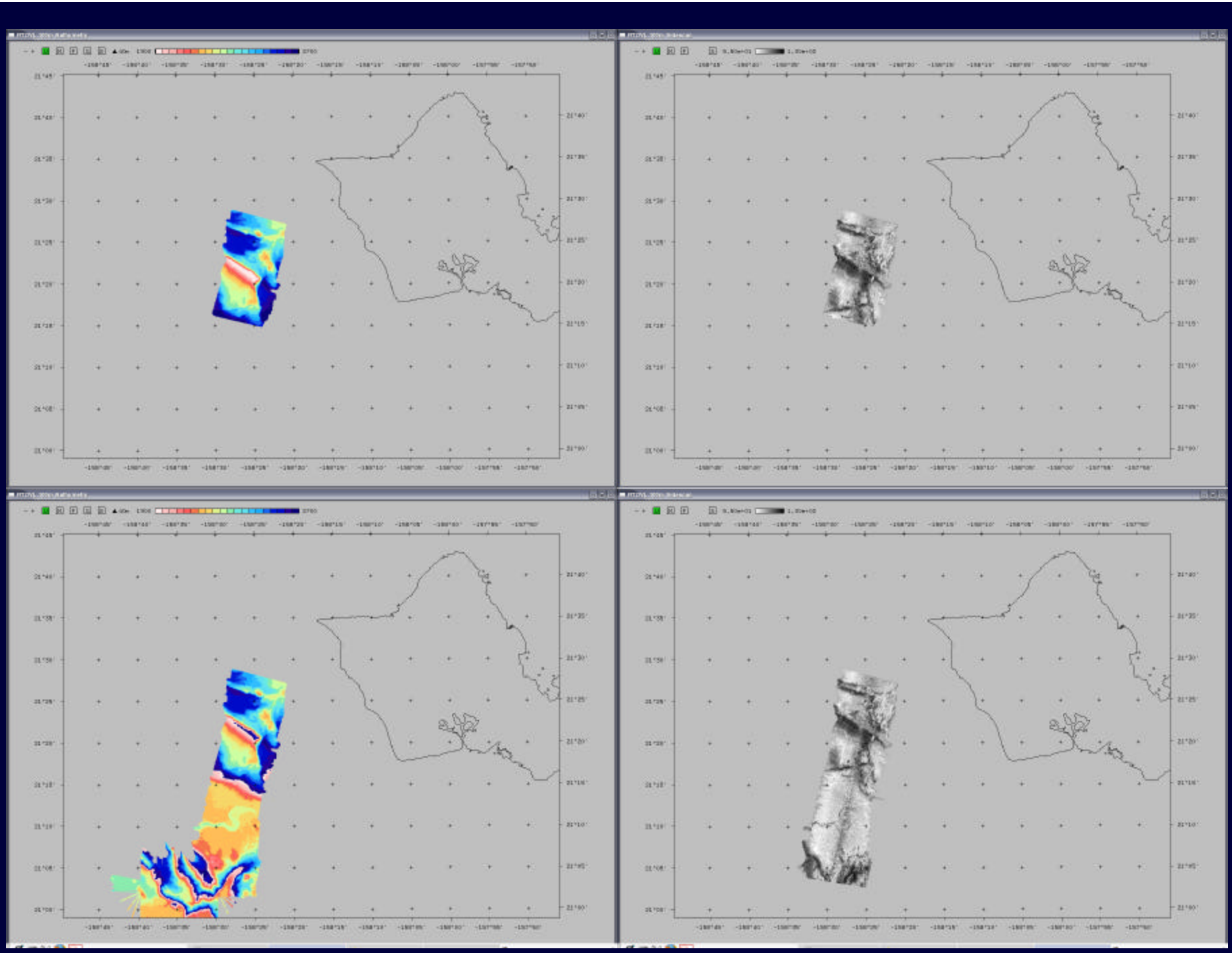

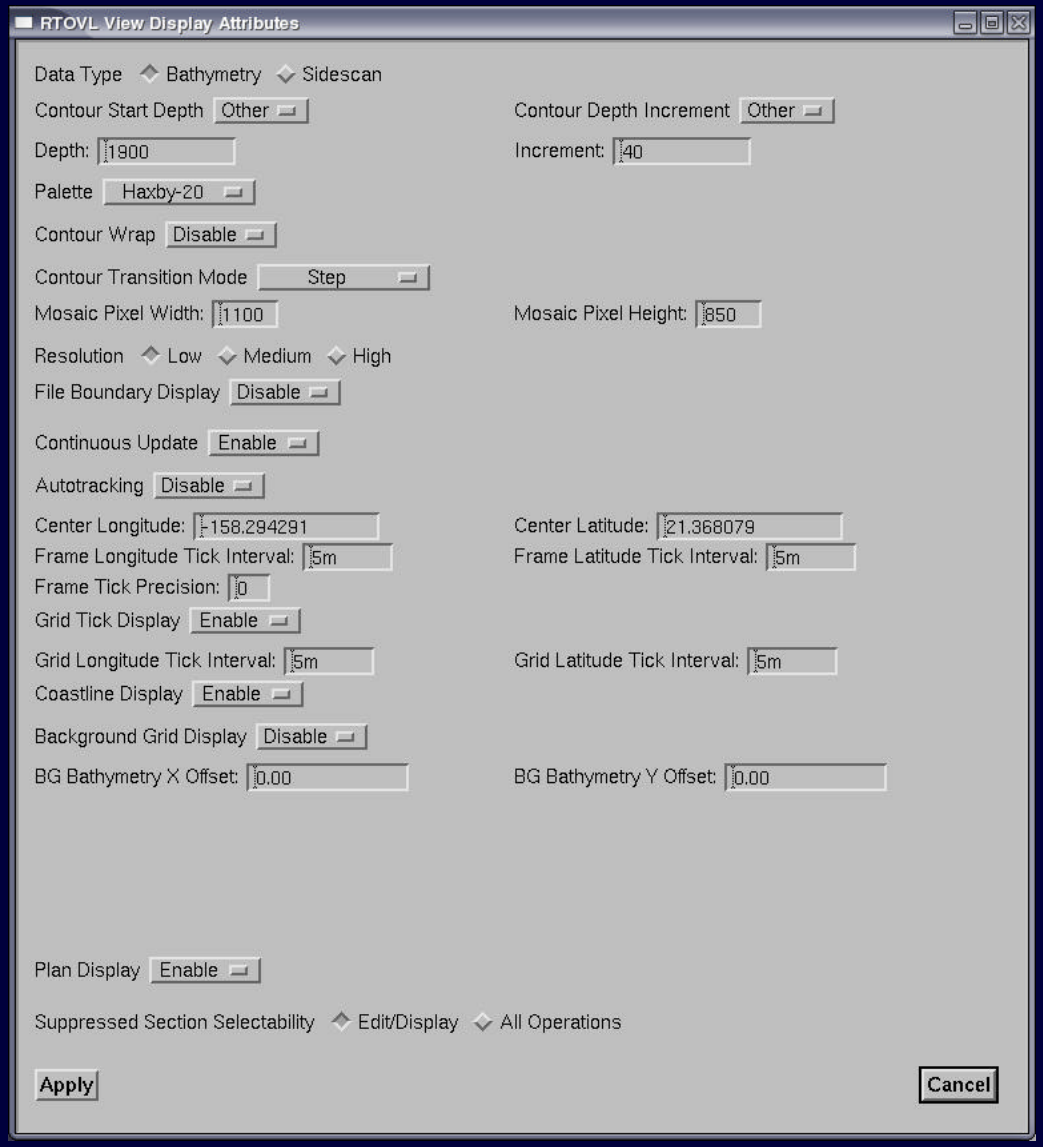
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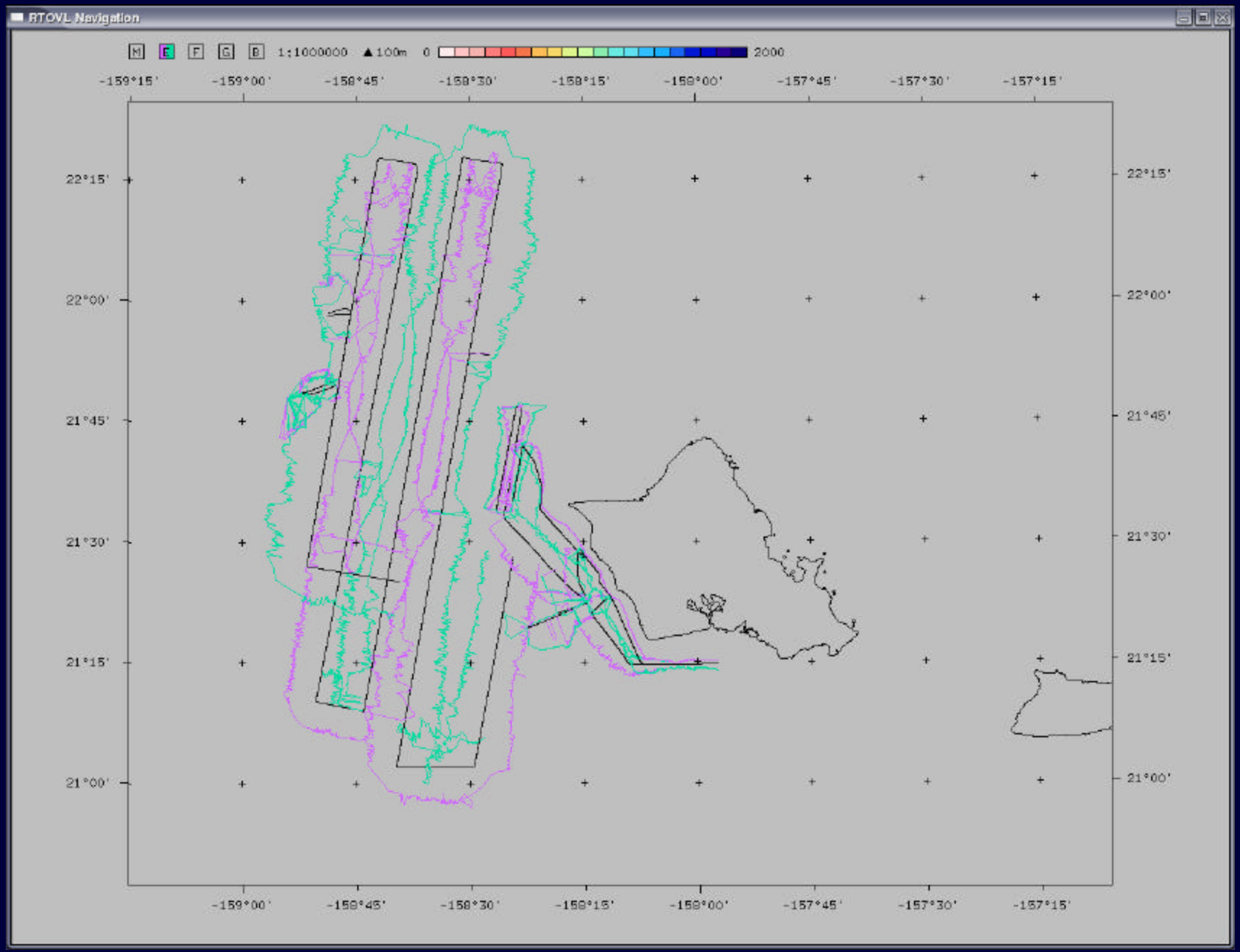
Data Type Bathymetry Sidescan
Contour Start Depth Other
Contour Depth Increment Other
Depth: 1900
Increment: 40
Palette Haxby-20
Contour Wrap Disable
Contour Transition Mode Step
Mosaic Pixel Width: 1100
Mosaic Pixel Height: 850
Resolution Low Medium High
File Boundary Display Disable
Continuous Update Enable
Autotracking Disable
Center Longitude: -158.294291
Center Latitude: 21.368079
Frame Longitude Tick Interval: 5m
Frame Latitude Tick Interval: 5m
Frame Tick Precision: 0
Grid Tick Display Enable
Grid Longitude Tick Interval: 5m
Grid Latitude Tick Interval: 5m
Coastline Display Enable
Background Grid Display Disable
BG Bathymetry X Offset: 0.00
BG Bathymetry Y Offset: 0.00
Plan Display Enable
Suppressed Section Selectability Edit/Display All Operations
Apply
Cancel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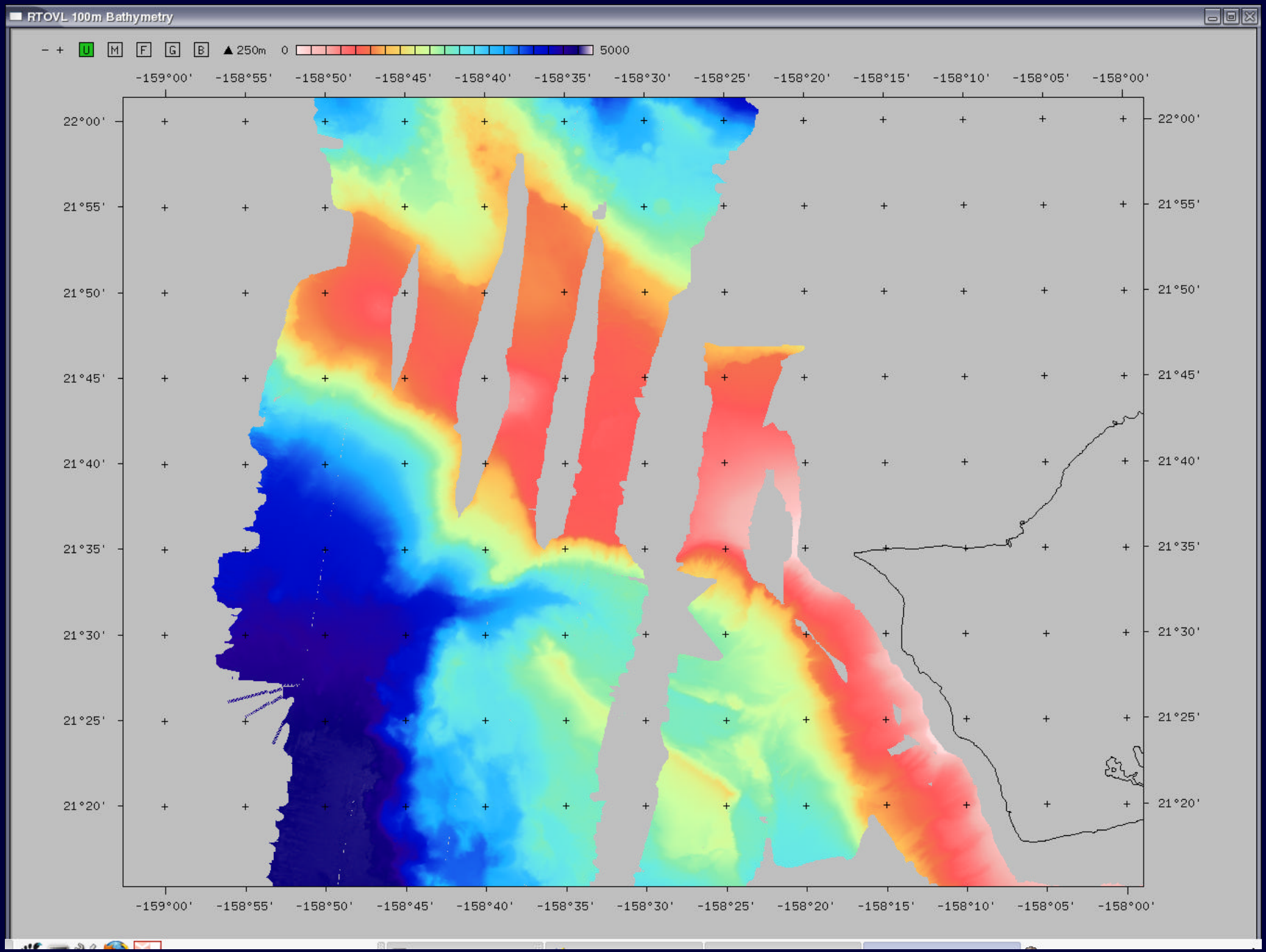
21°45'
21°30'
21°15'
21°00'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-158°05'
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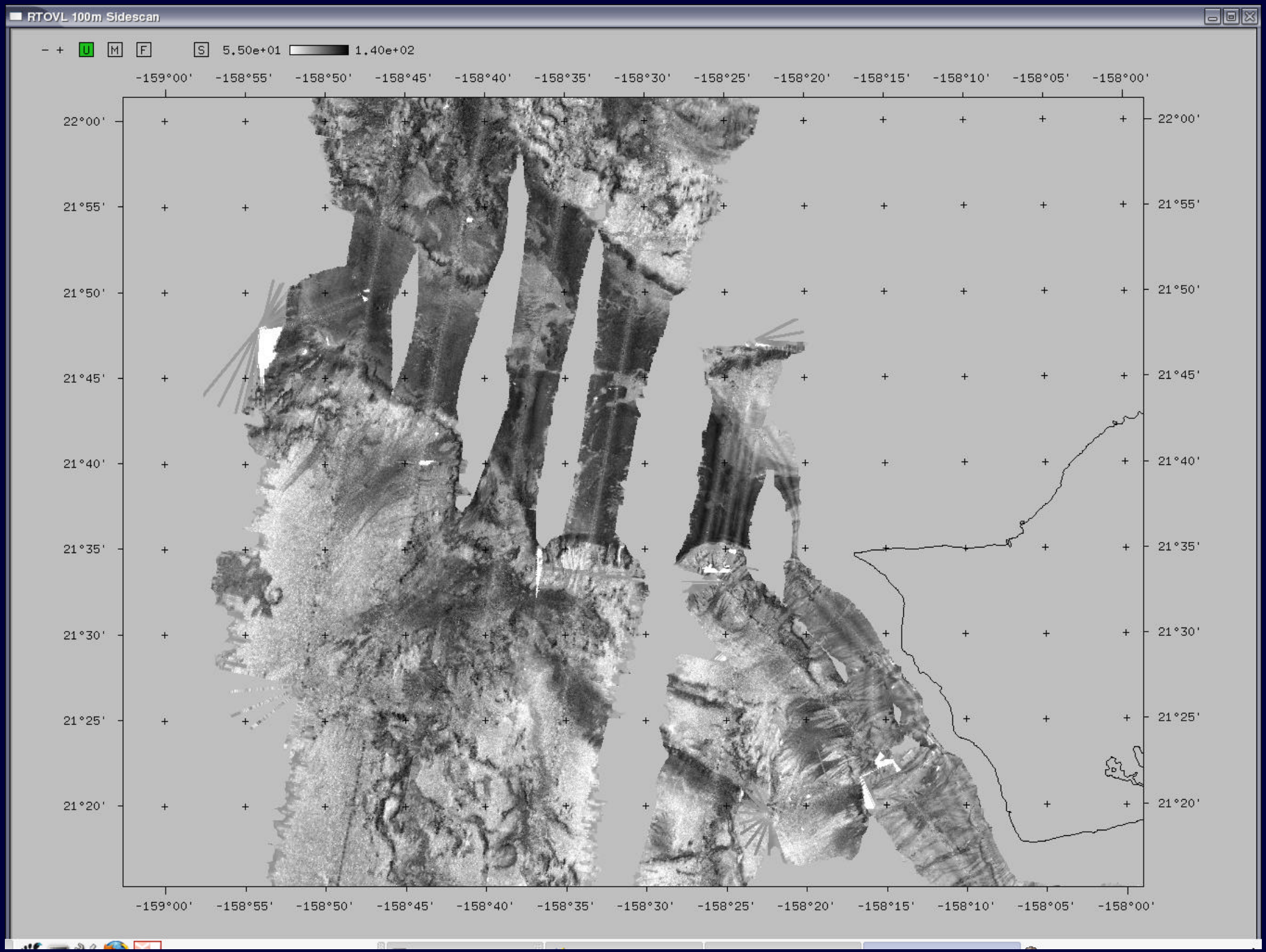
RTOVL 100m Sidescan
U
M
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S
5.50e+01
1.40e+02
-159°00'
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-158°50'
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-158°15'
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-158°05'
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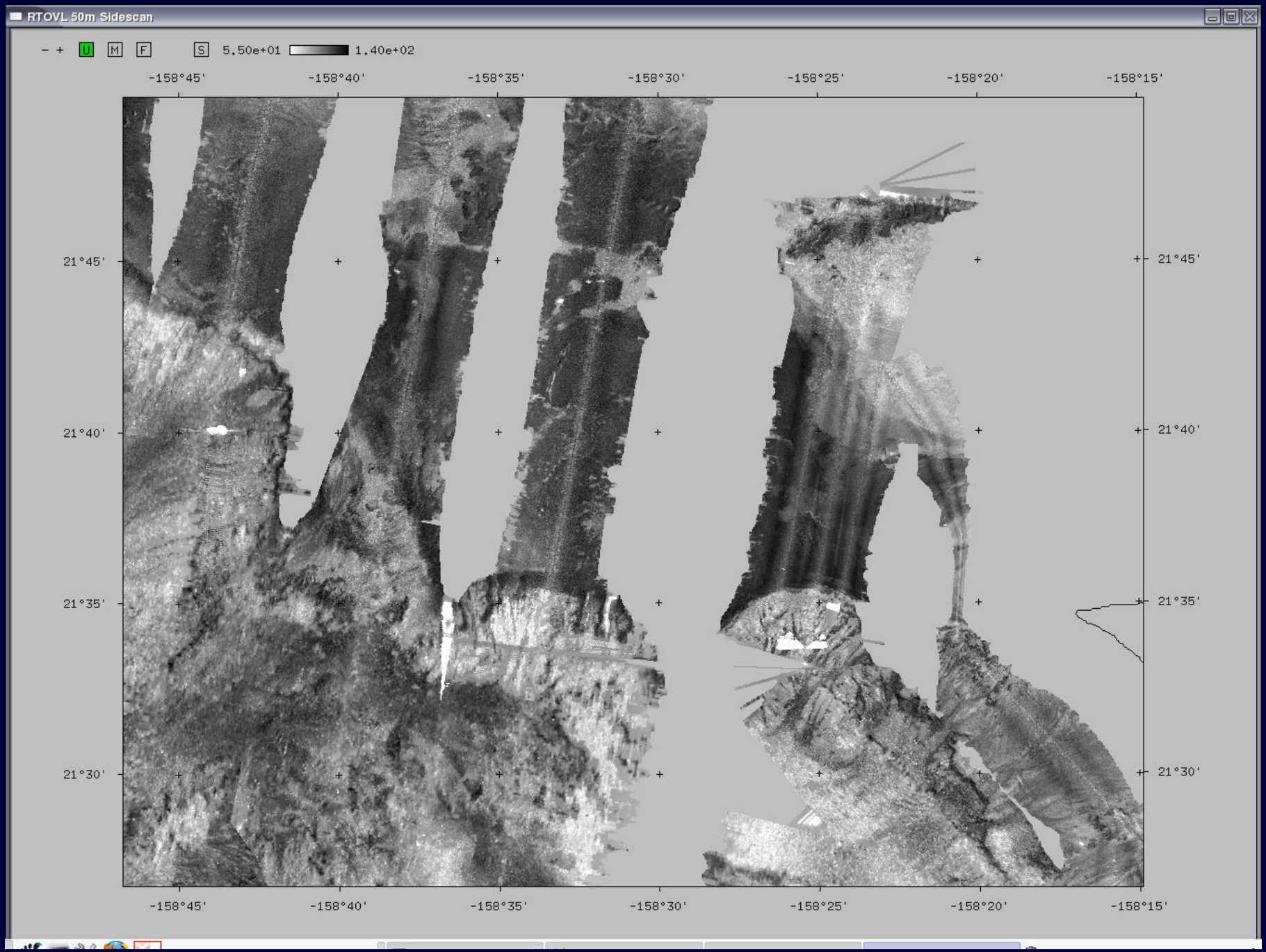
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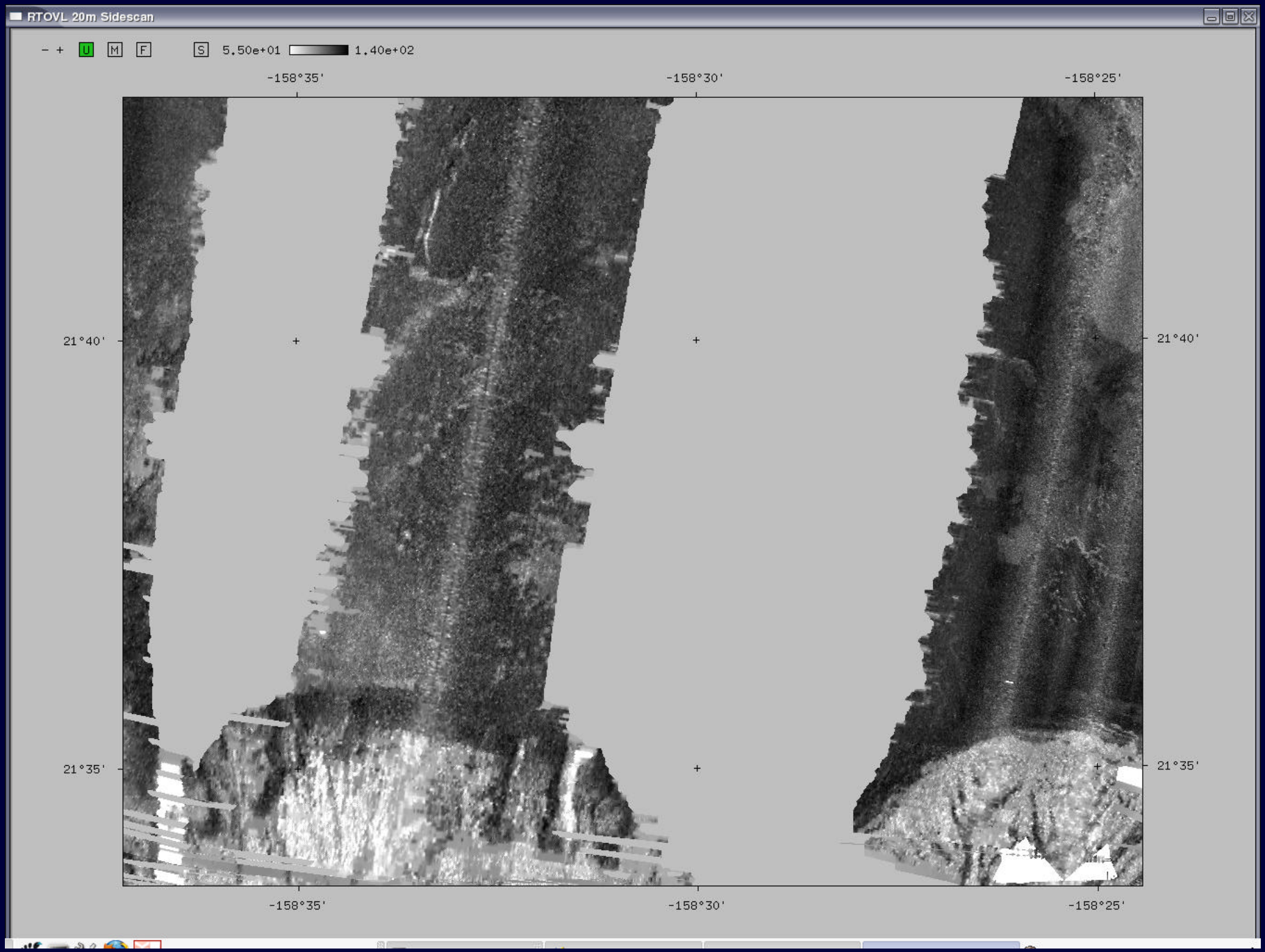
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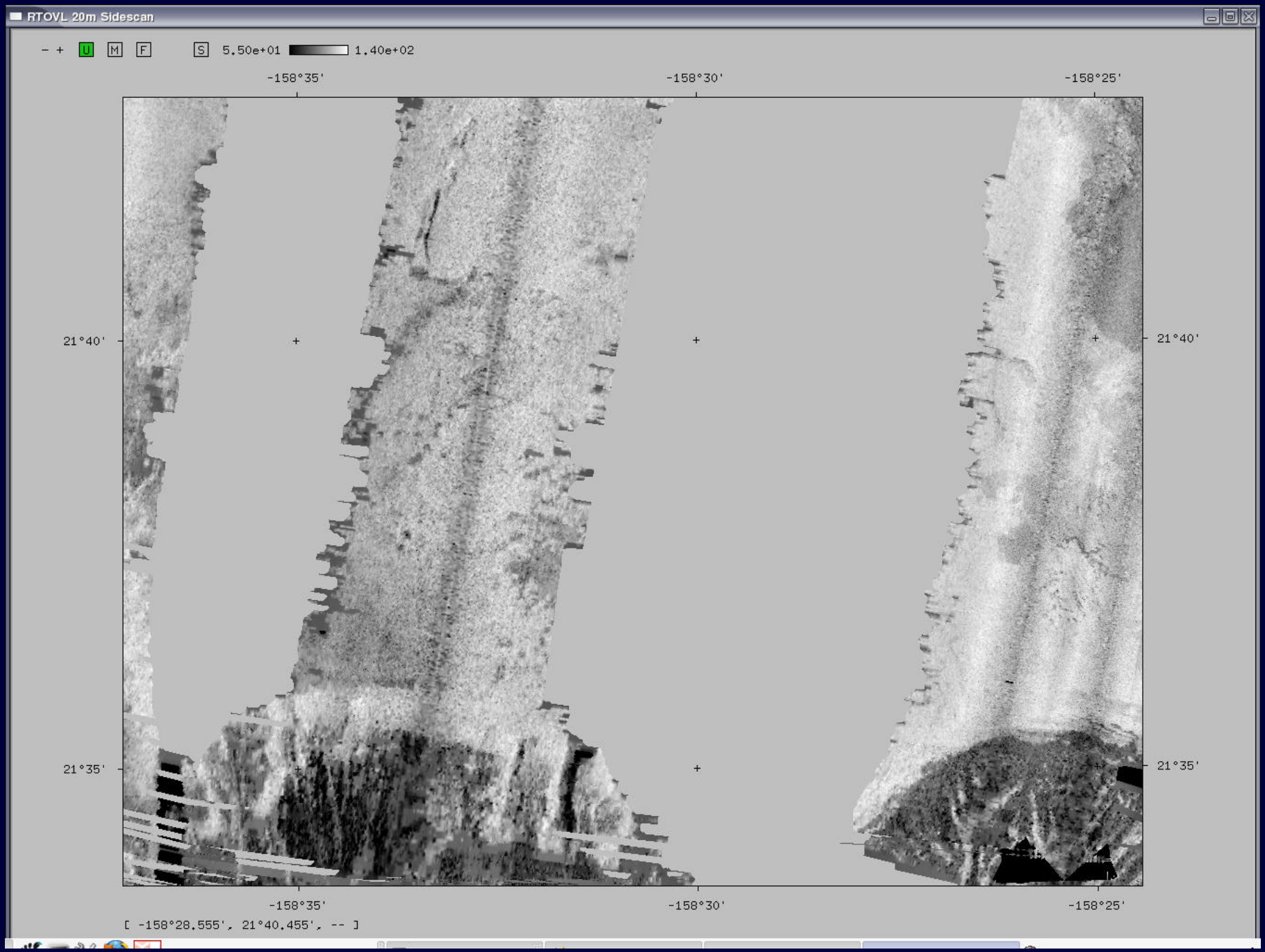
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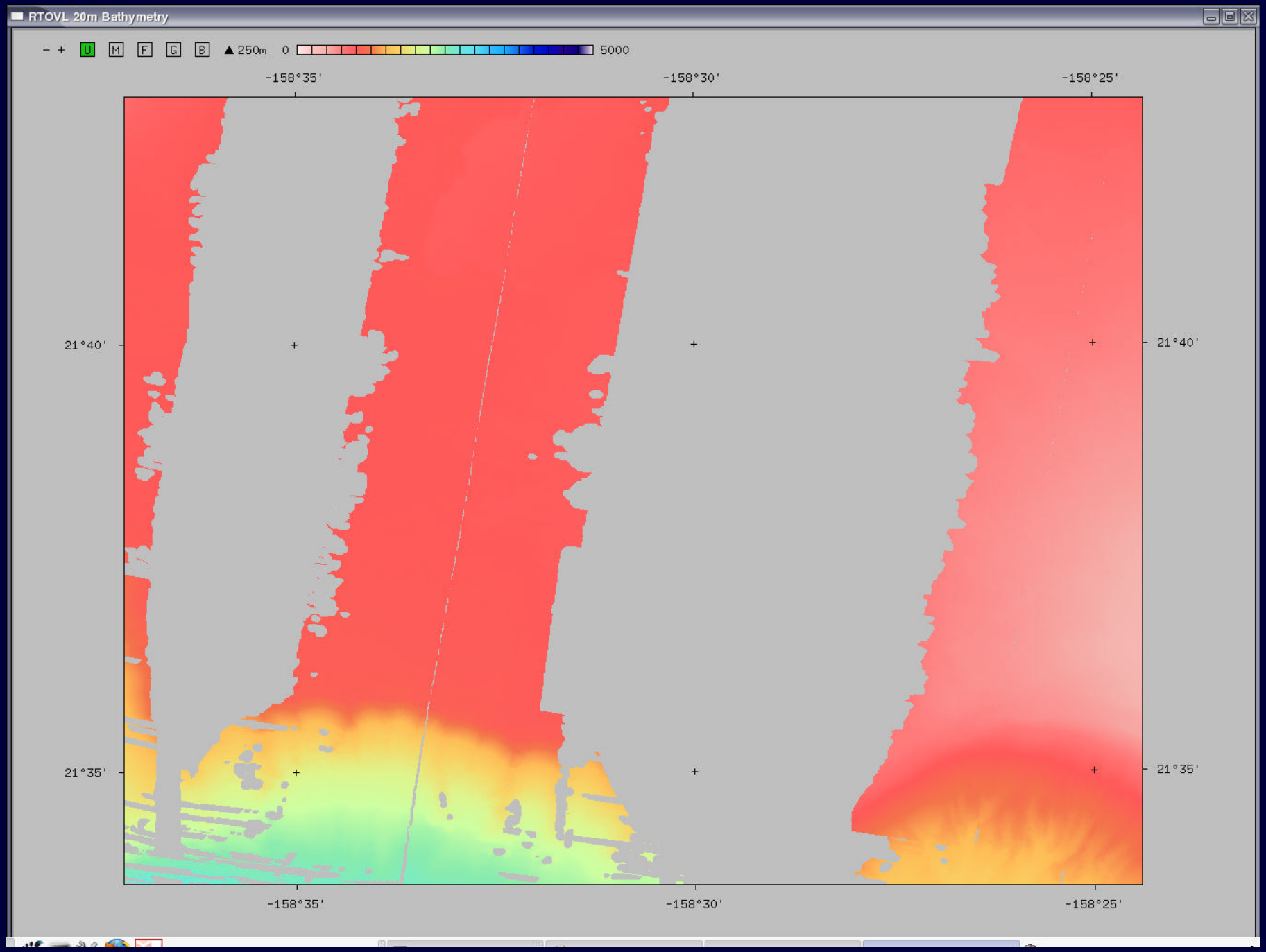
RTOVL 20m Bathymetry
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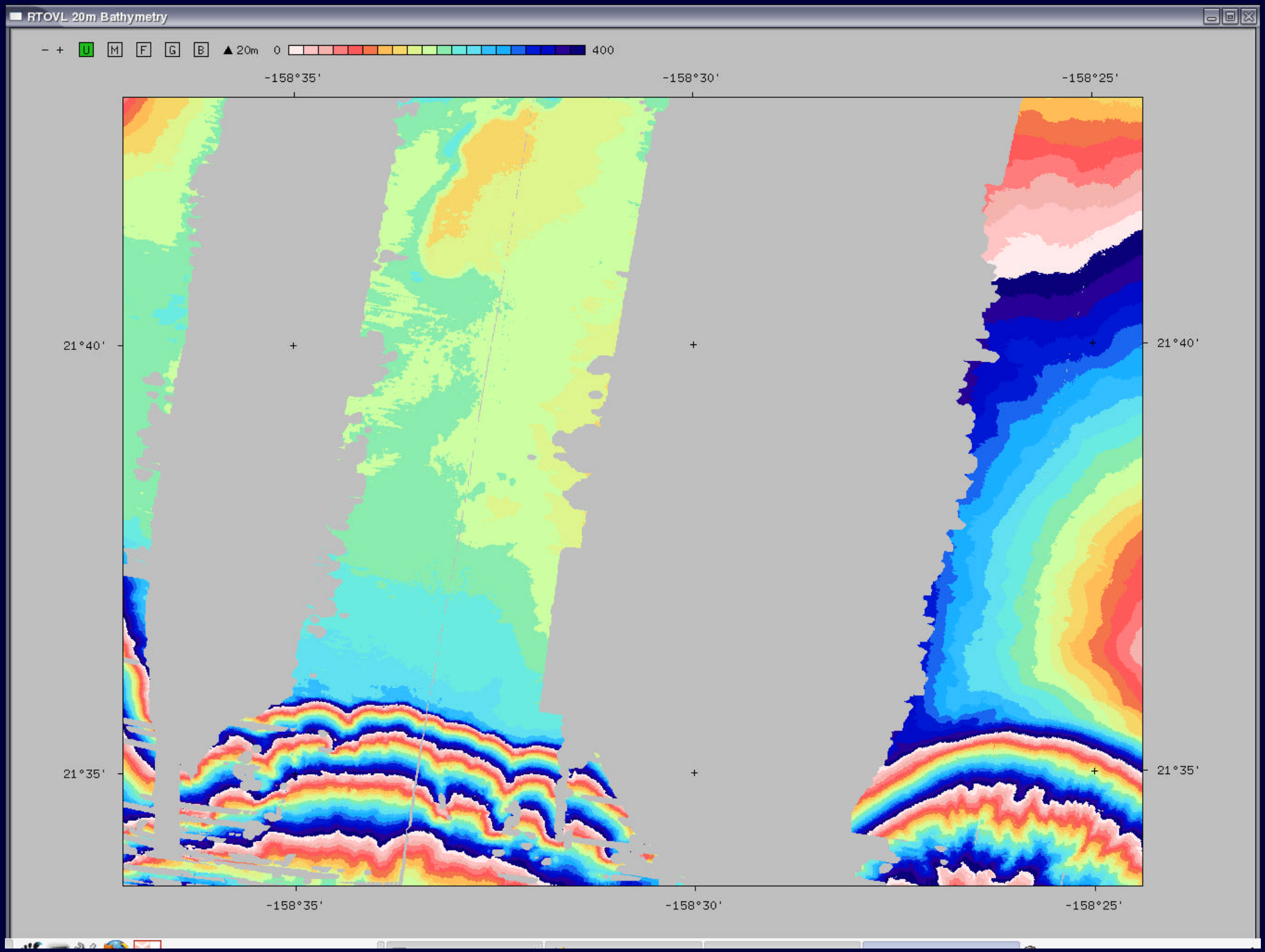
-158°25'
21°40'
21°35'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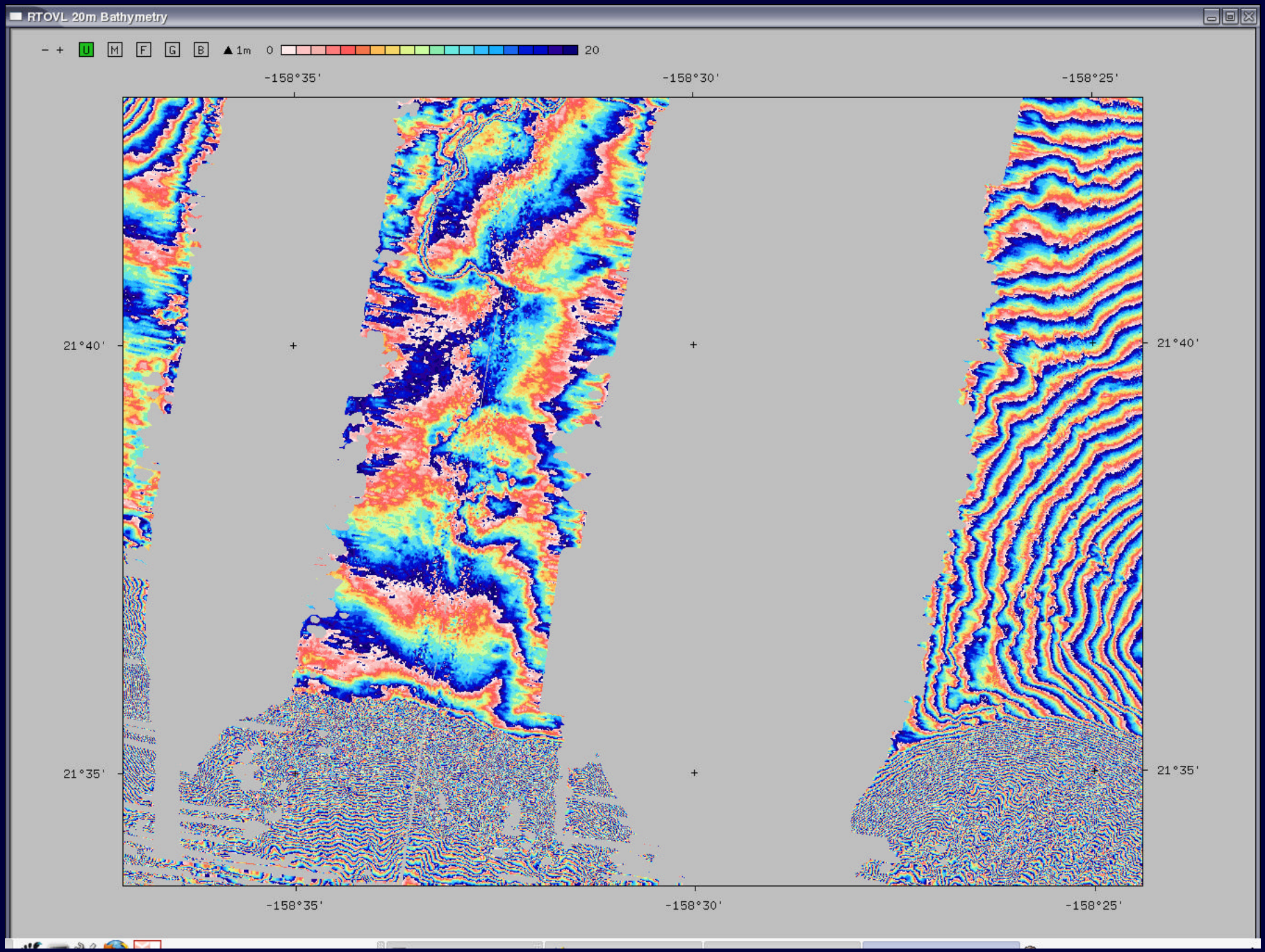
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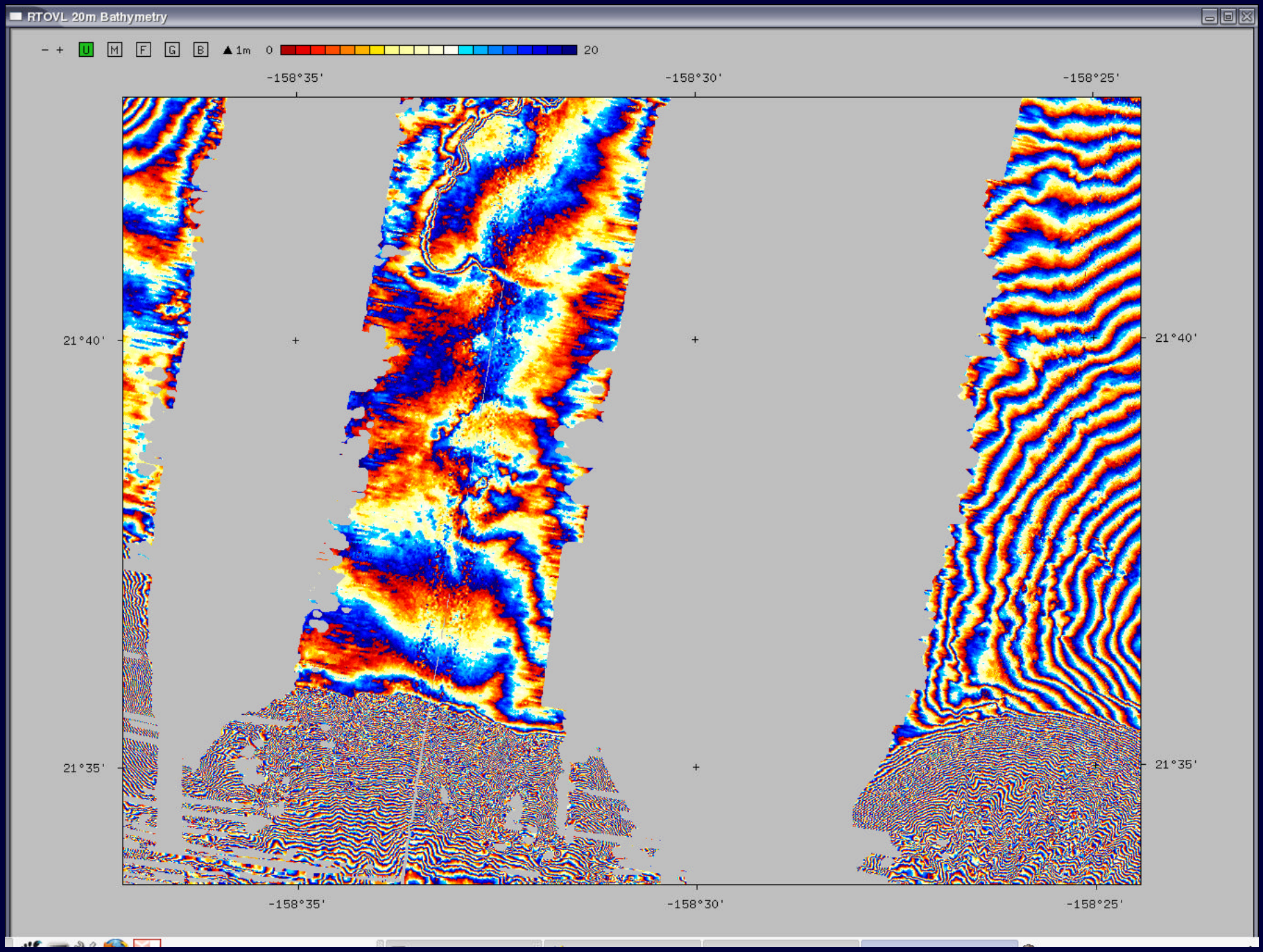
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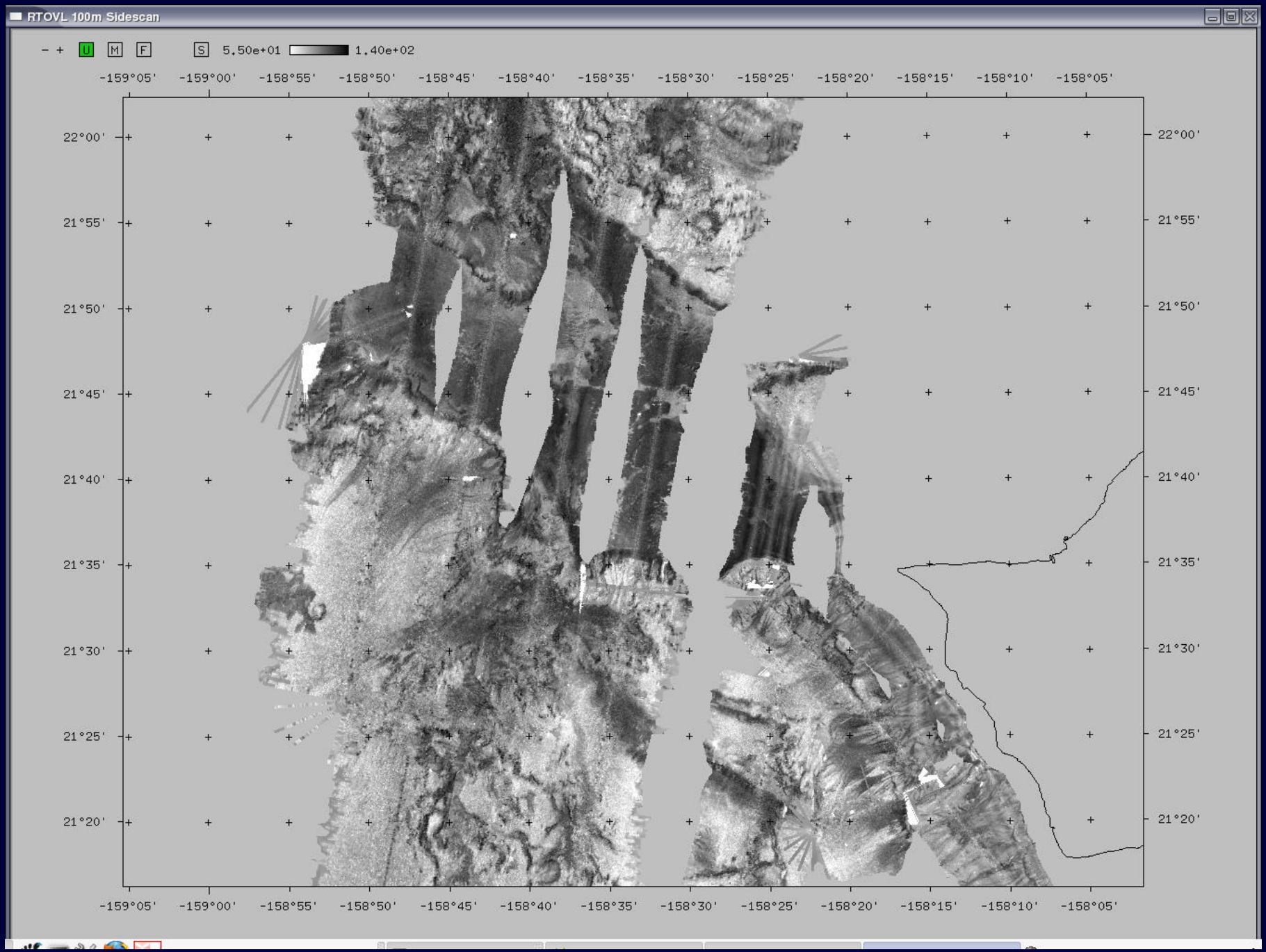
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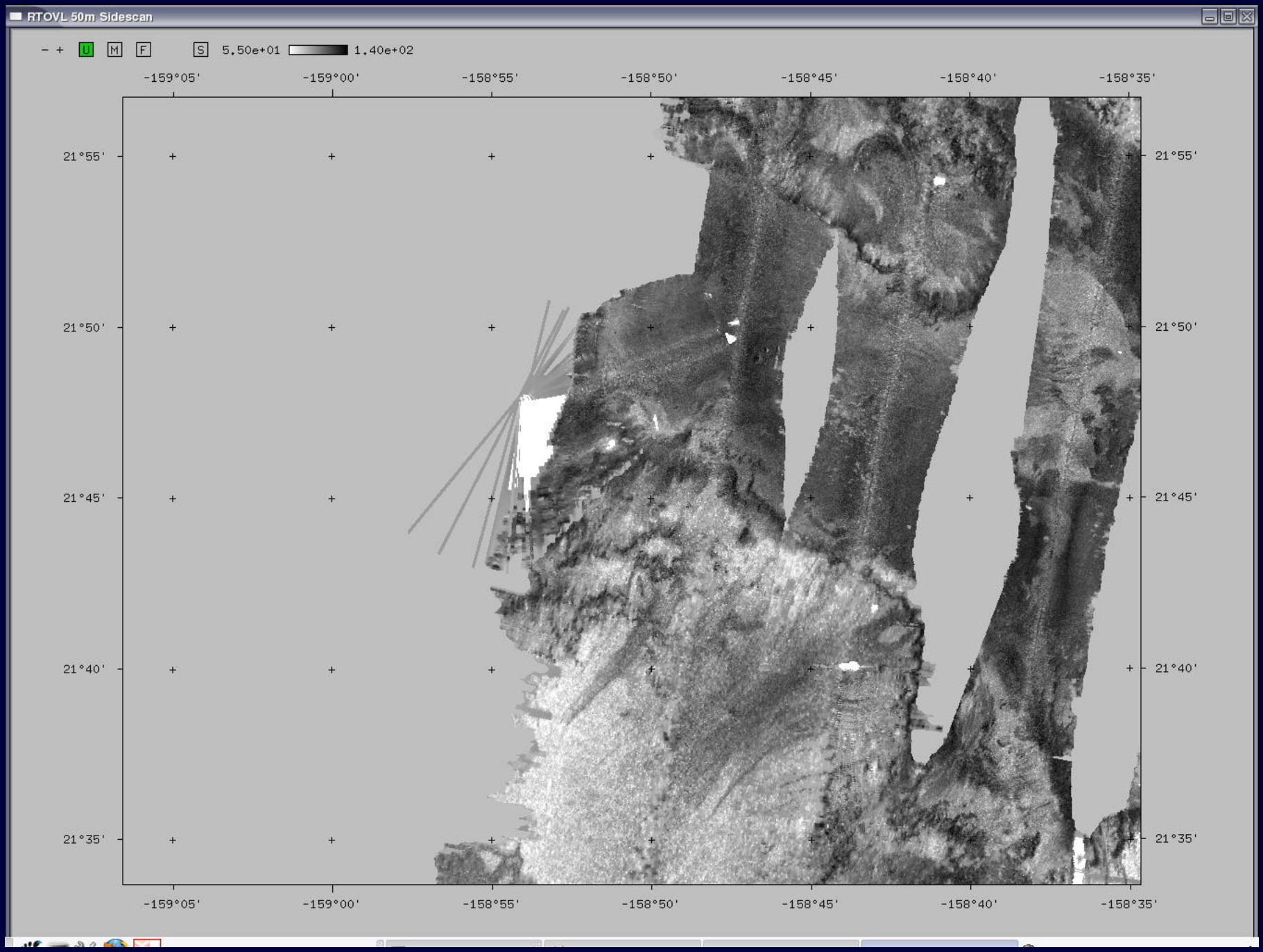
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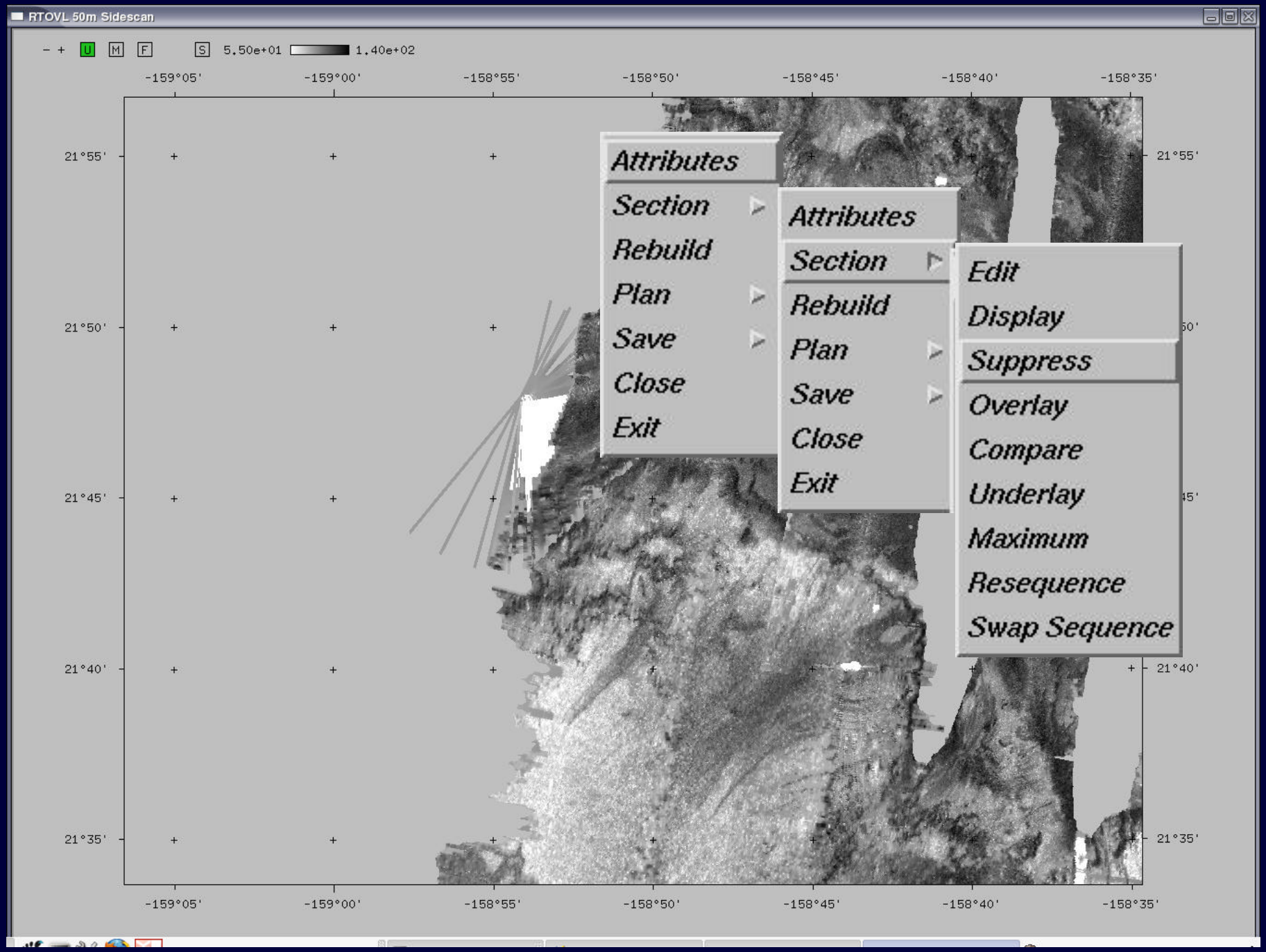
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Attributes
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Rebuild
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Save
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Overlay
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Underlay
Maximum
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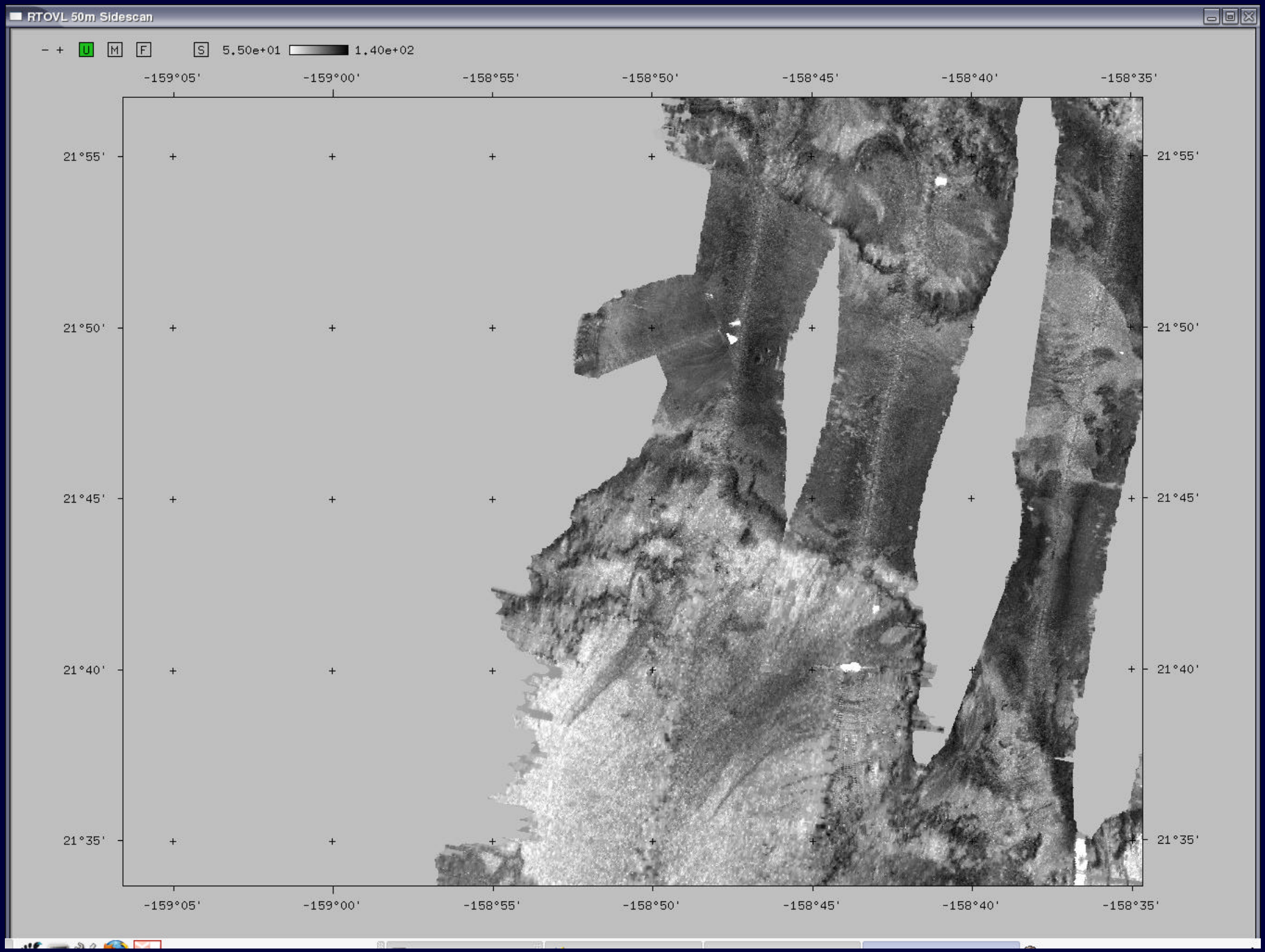
Swap Sequence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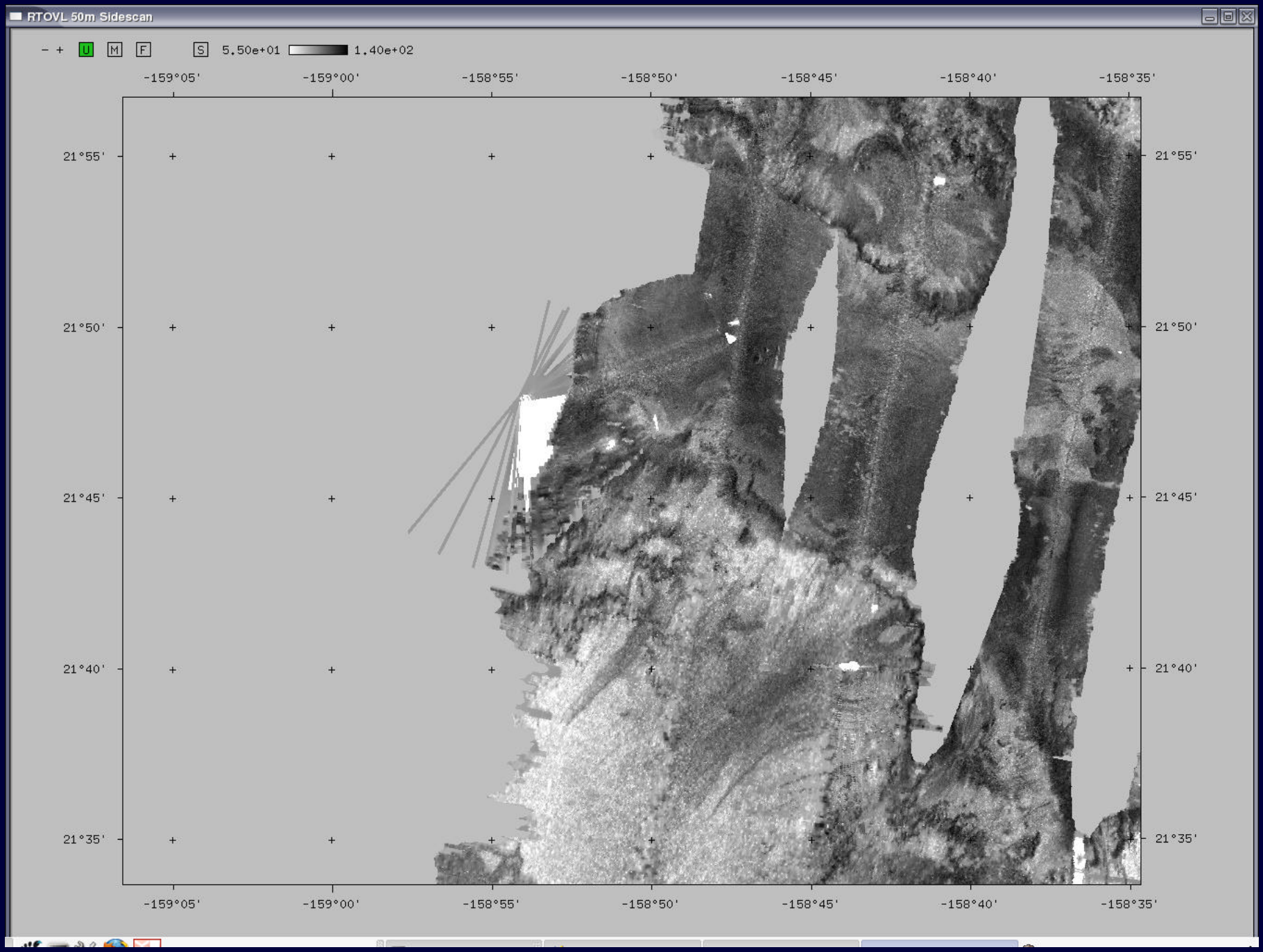
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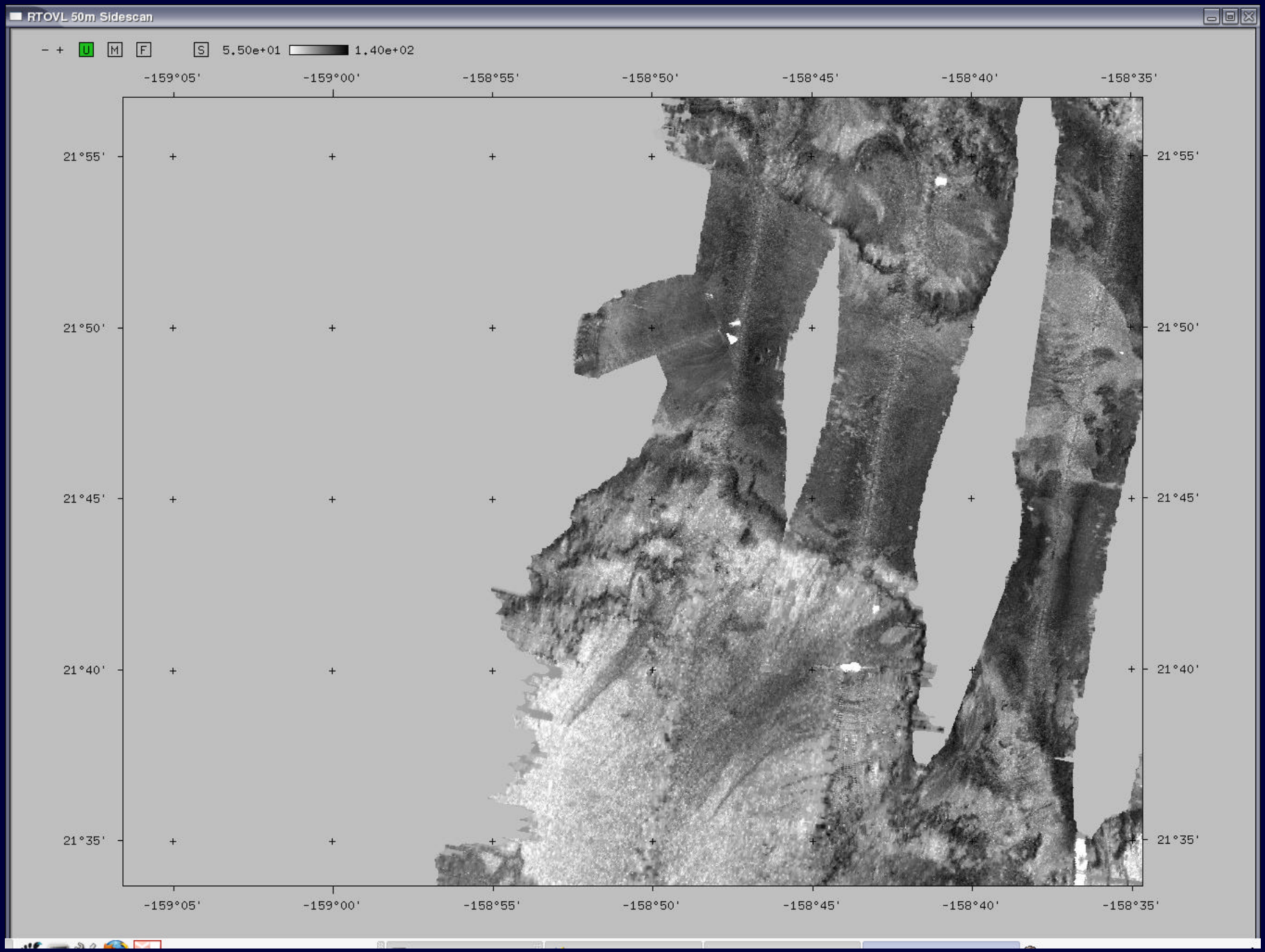
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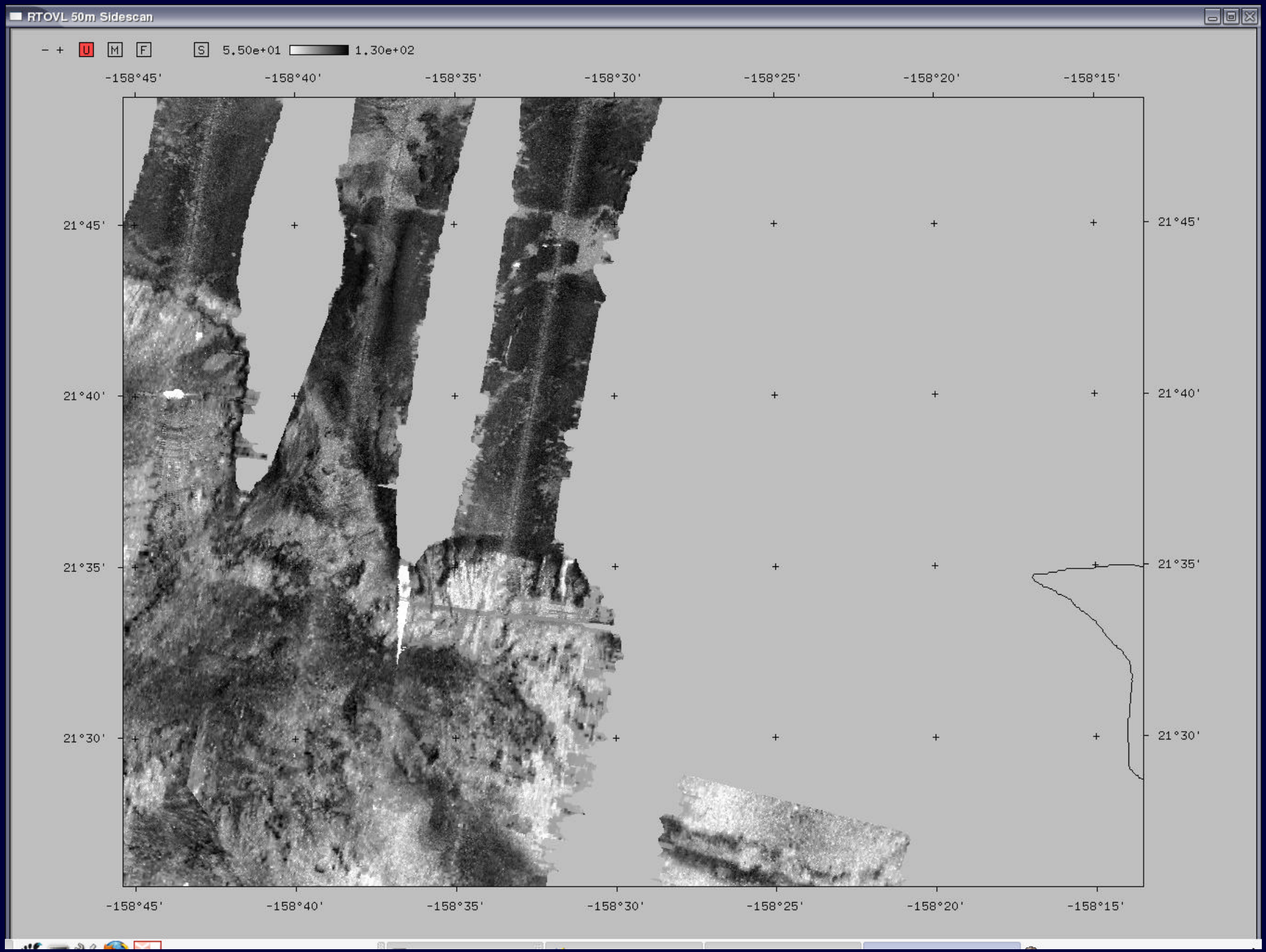
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- + U M F S 5.50e+01 1.30e+02
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-158°40'
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-158°30'
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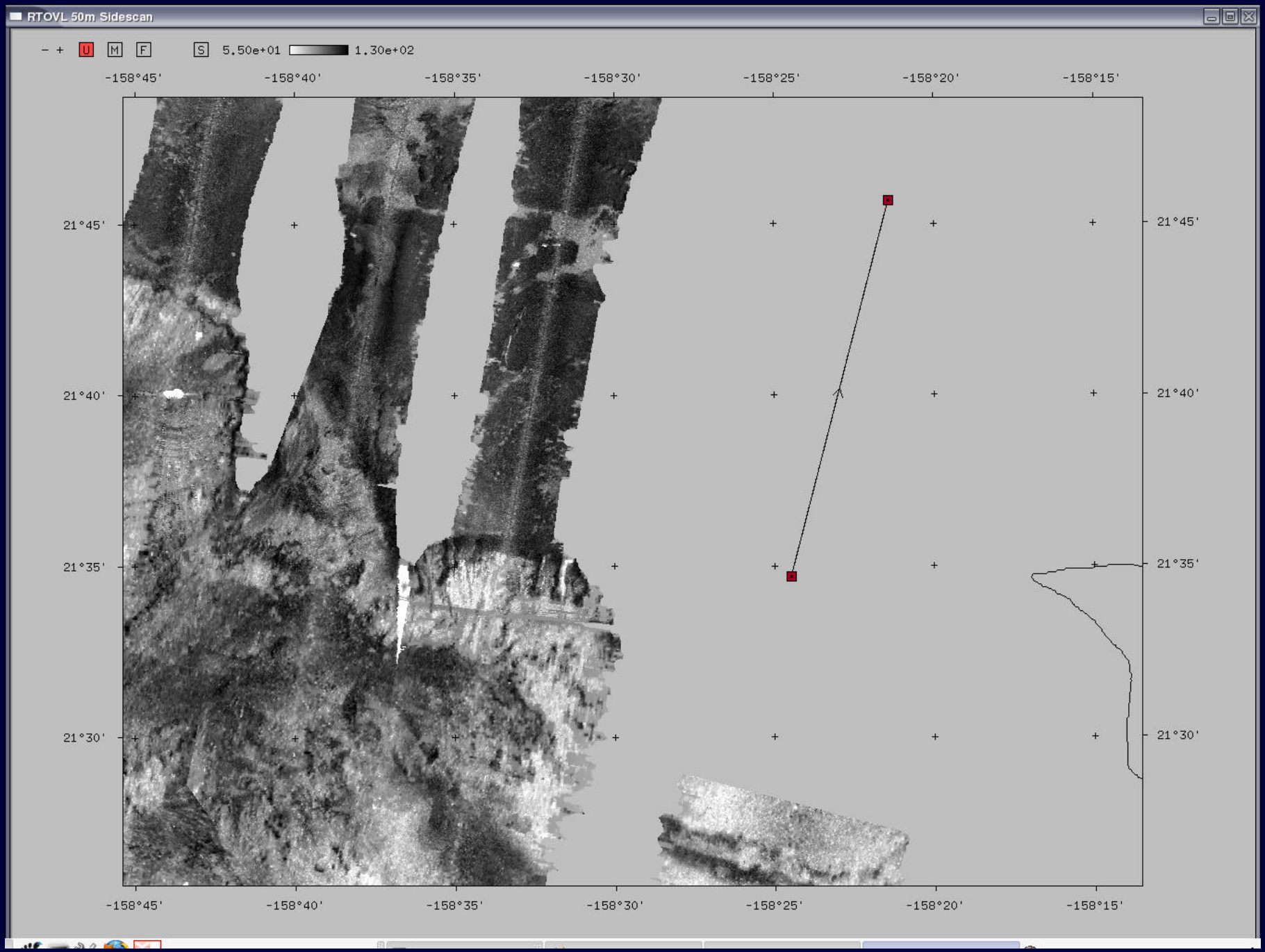
-158°20'
-158°15'
21°45'
21°40'
21°35'
21°30'


RTOVL 50m Sidescan
- + U M F S 5.50e+01 1.30e+02
-158°45' -158°40' -158°35' -158°30' -158°25' -158°20' -158°15'
21°45' 21°40' 21°35' 21°30'
Attributes
Section
Rebuild
Plan
Save
Close
Exit
Append
Insert
Shift / Resize
Fixate
Delete
Reverse
Undo
Waypoints
Tracks
Subset Clone
File


RTOVL 50m Sidescan
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-158°45'
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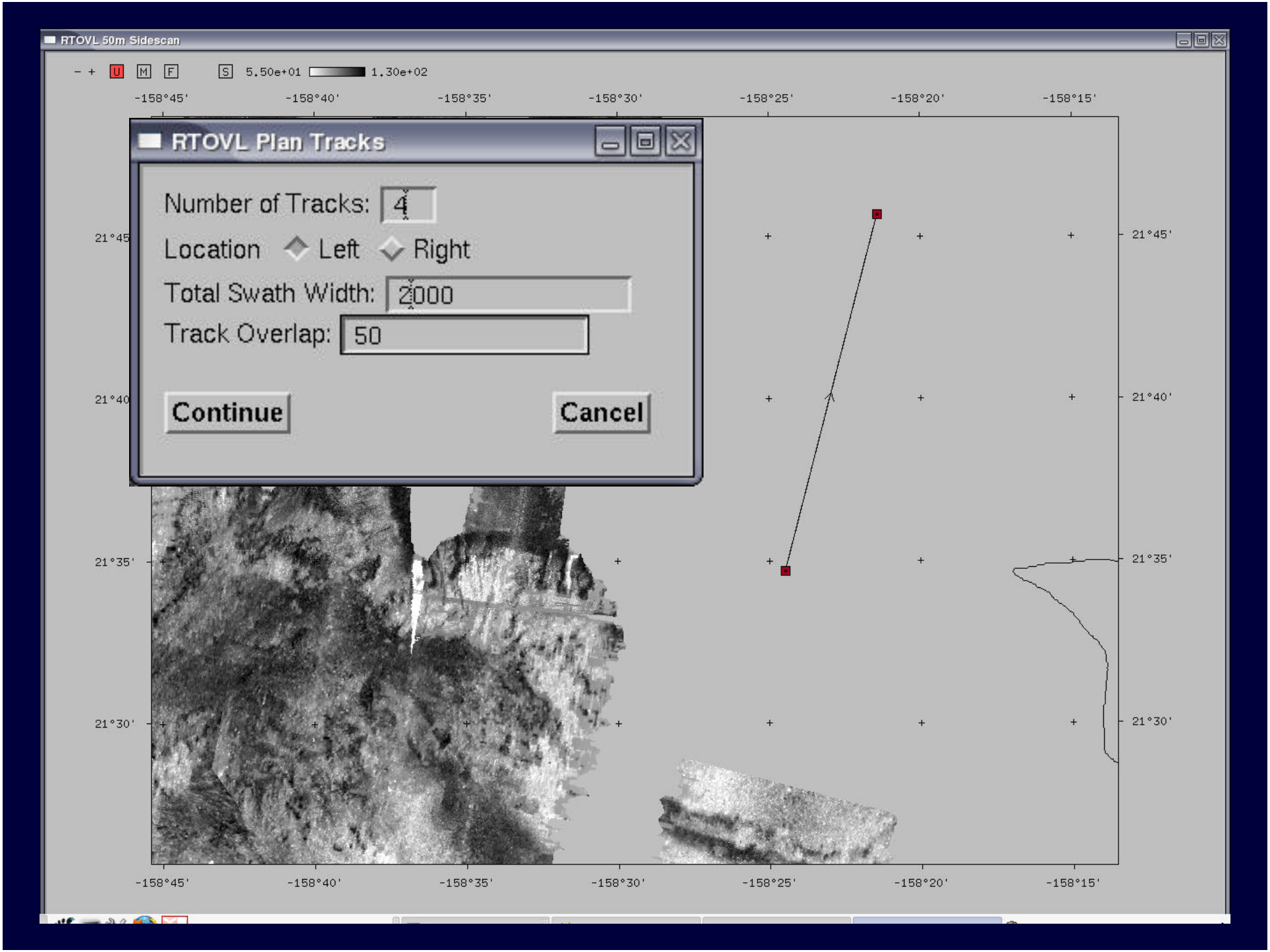
21°30'


RTOVL 50m Sidescan
5.50e+01
1.30e+02
-158°45'
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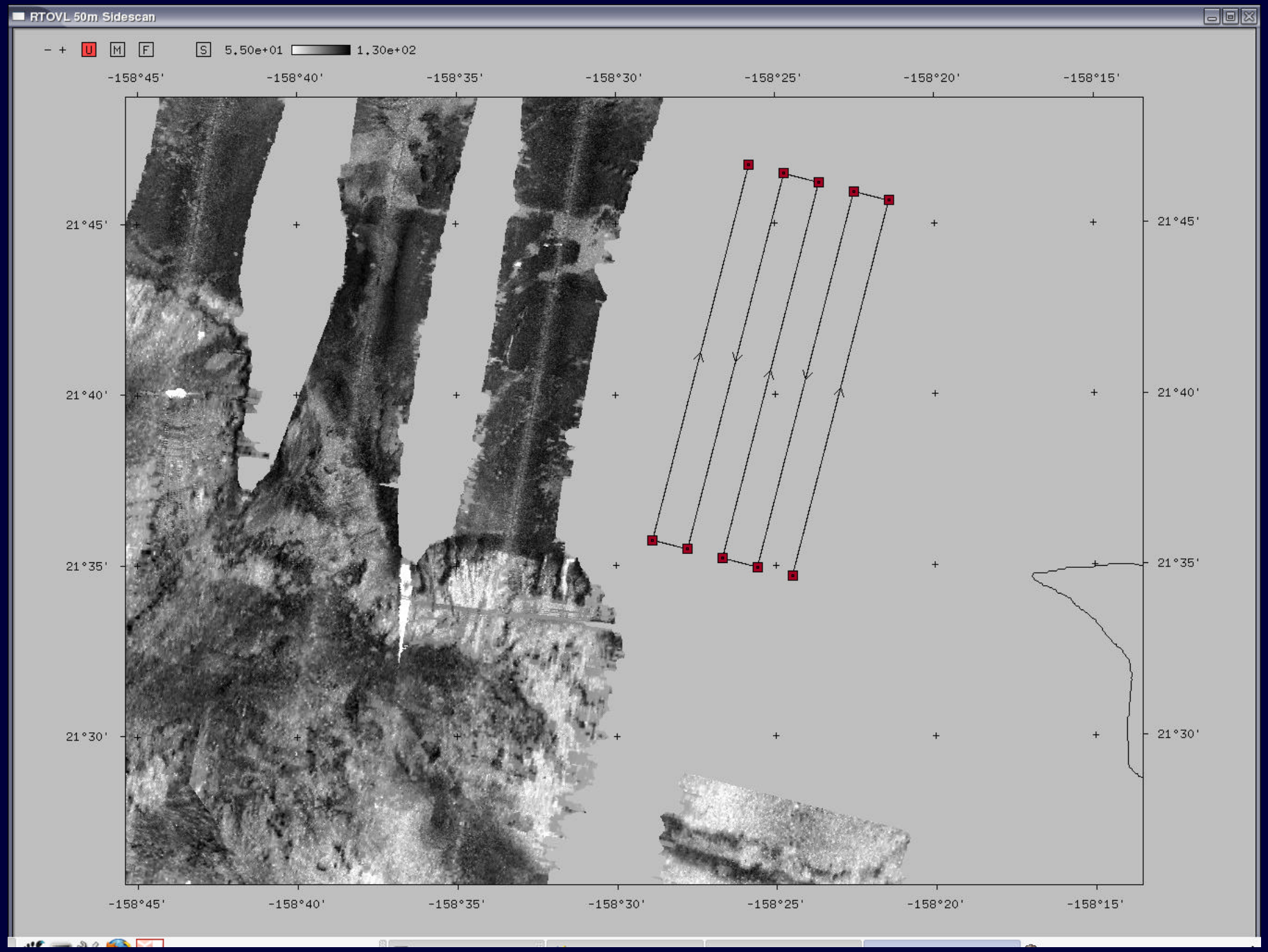
-158°35'
-158°30'
-158°25'
-158°20'
-158°15'
21°45'
21°40'
21°35'
21°30'
RTOVL Plan Tracks
Number of Tracks: 4
Location Left Right
Total Swath Width: 2000
Track Overlap: 50
Continue
Cancel


RTOVL 50m Sidescan
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5.50e+01
1.30e+02
-158°45'
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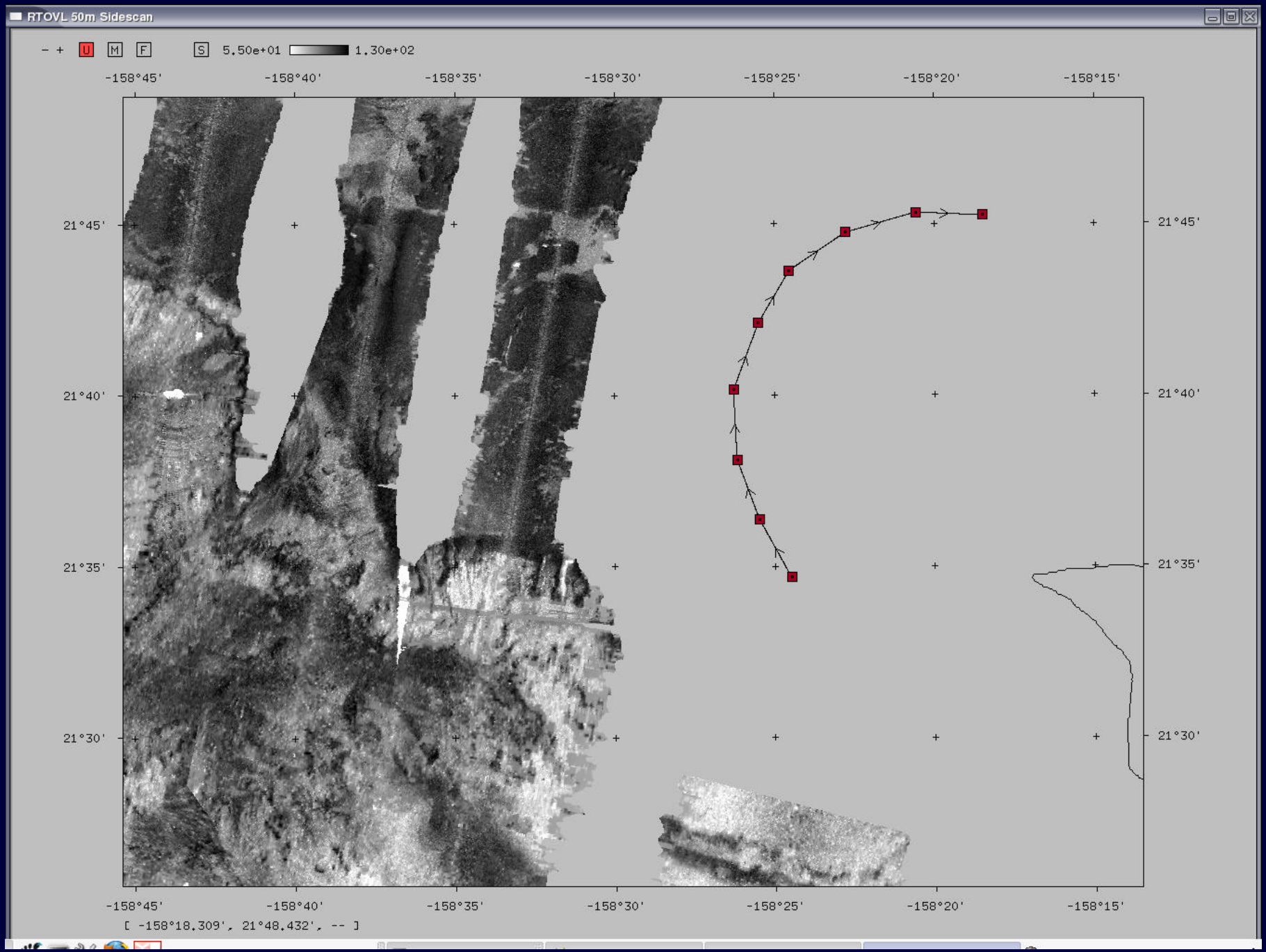
RTOVL 50m Sidescan
- + U M F S 5.50e+01 1.30e+02
-158°45'
-158°40'
-158°35'
-158°30'
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-158°20'
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21°45'
21°40'
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21°30'
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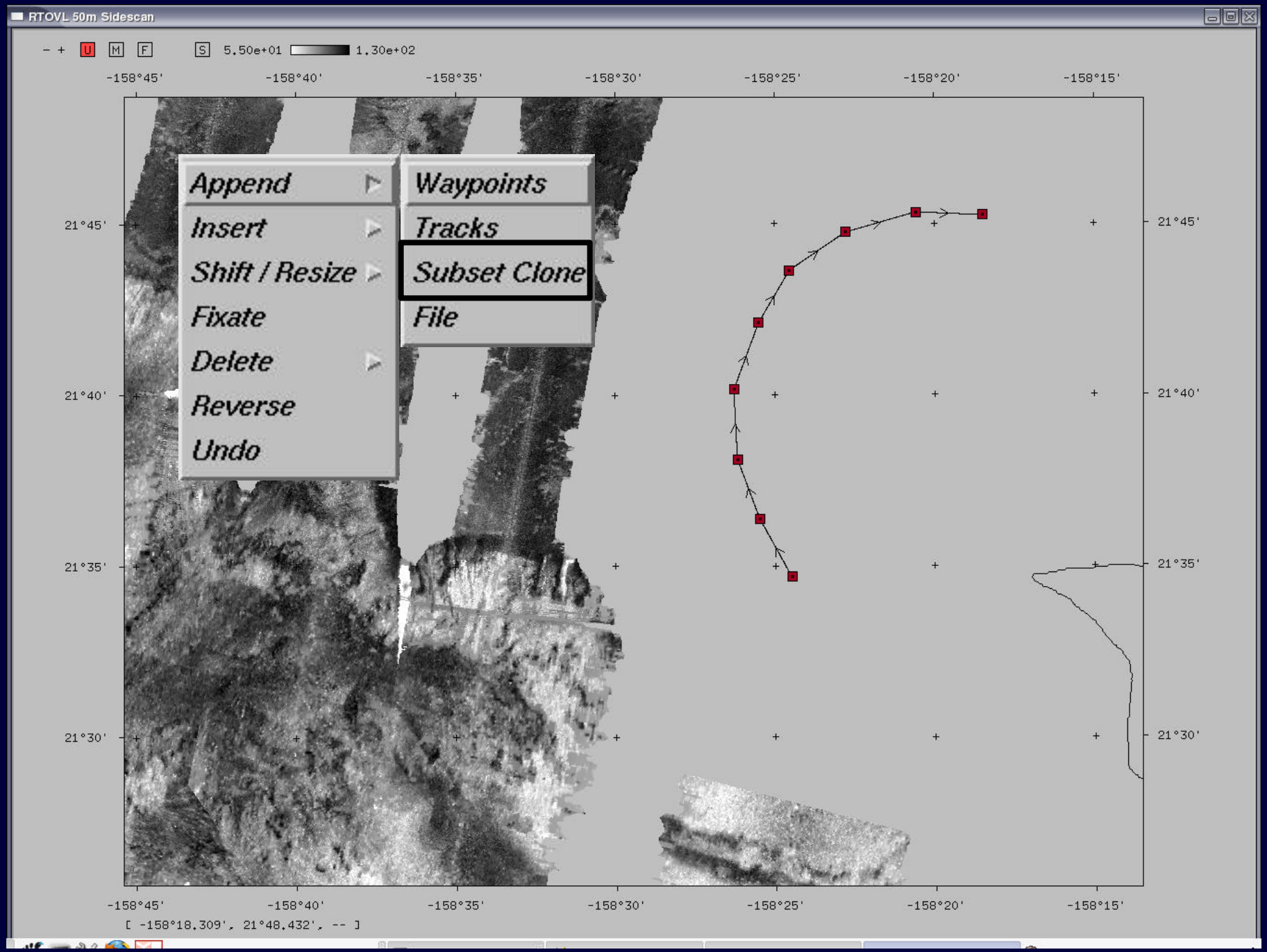
RTOVL 50m Sidescan
- + U M F S 5.50e+01 1.30e+02
-158°45' -158°40' -158°35' -158°30' -158°25' -158°20' -158°15'
21°45' 21°40' 21°35' 21°30'
Append
Insert
Shift / Resize
Fixate
Delete
Reverse
Undo
Waypoints
Tracks
Subset Clone
File
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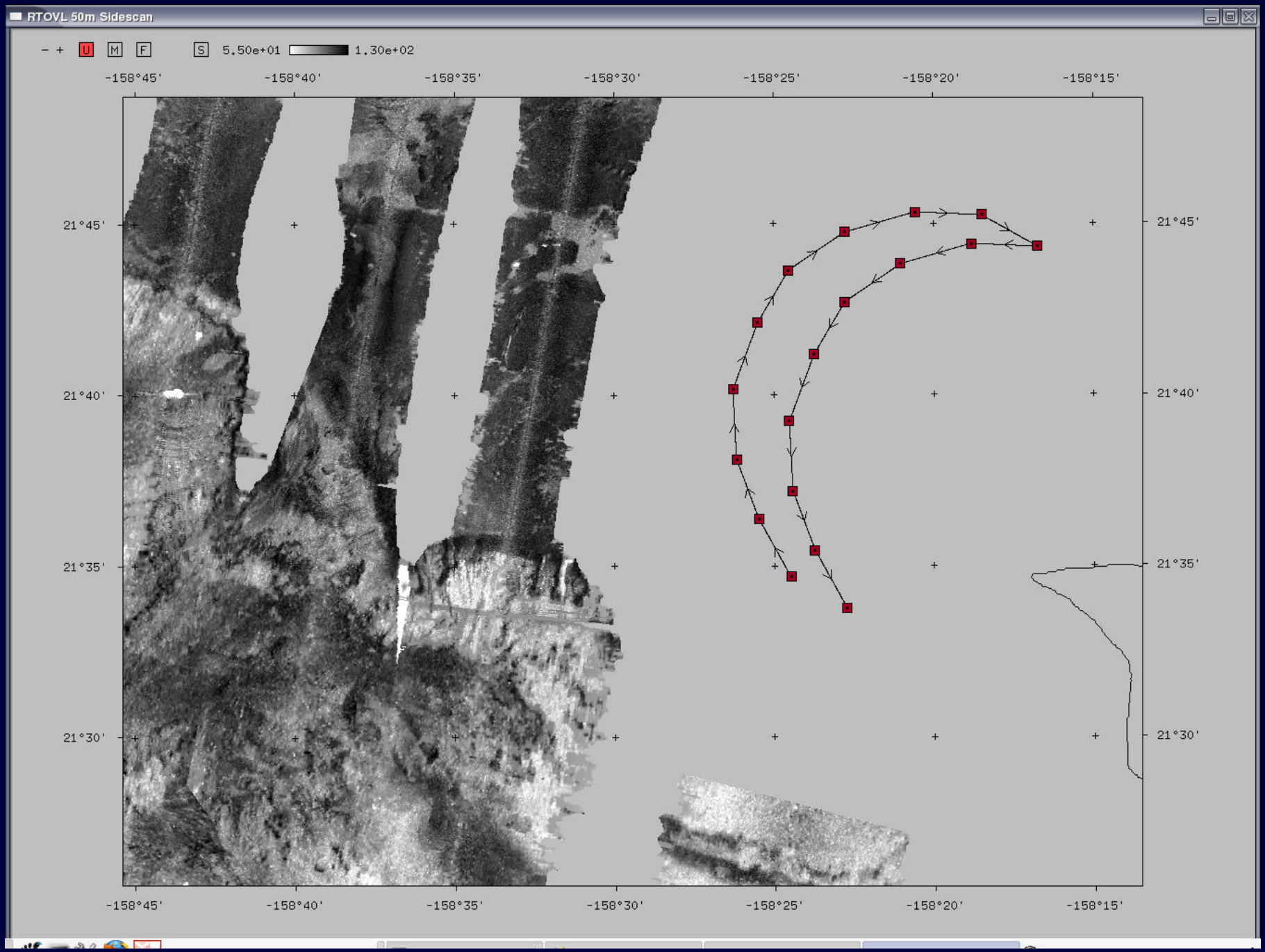
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U
M
F
S
5.50e+01
1.30e+02
-158°45'
-158°40'
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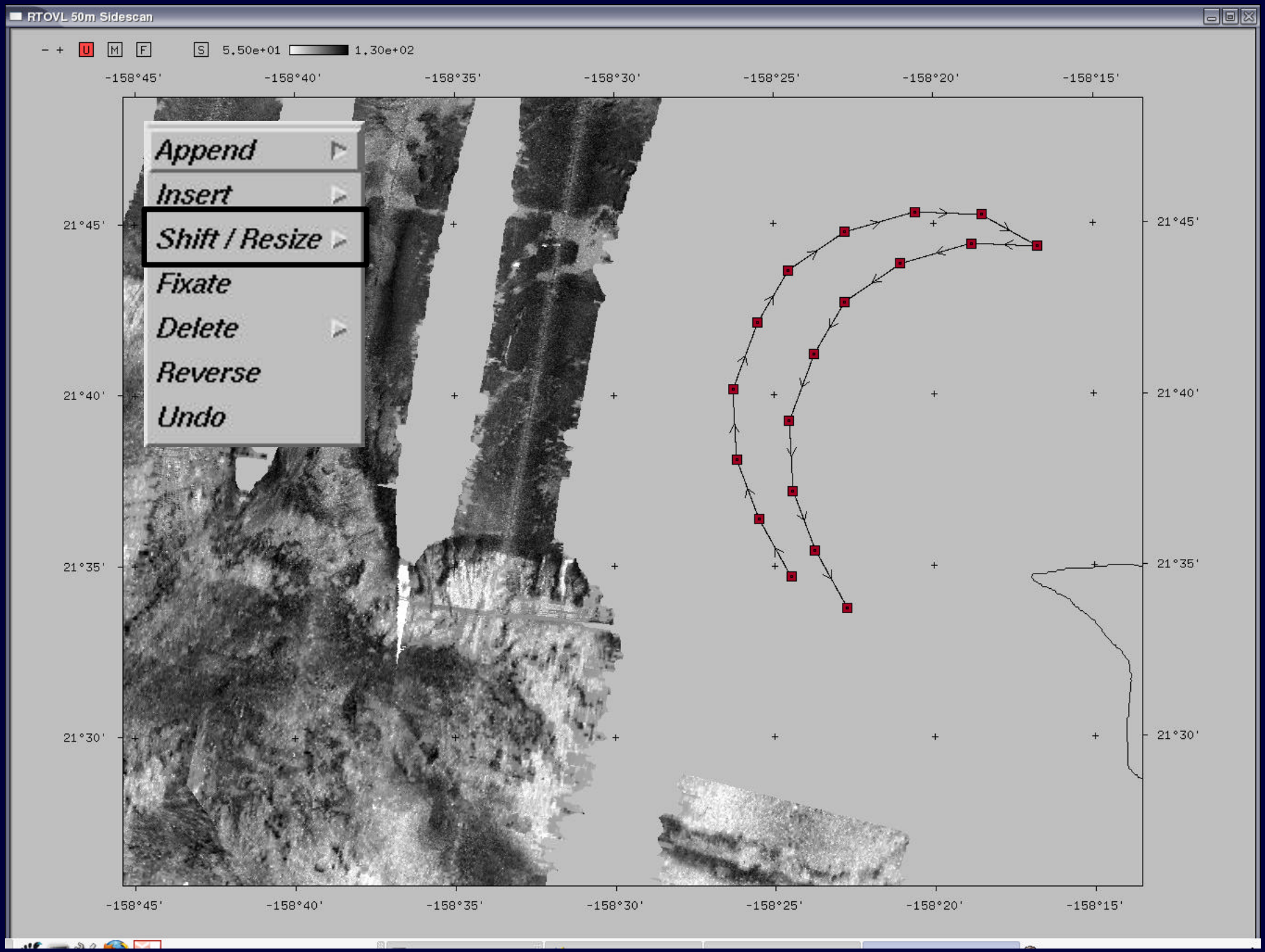
-158°20'
-158°15'
21°45'
21°40'
21°35'
21°30'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U
M
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S
5.50e+01
1.30e+02
-158°45'
-158°40'
-158°35'
-158°30'
-158°25'
-158°20'
-158°15'
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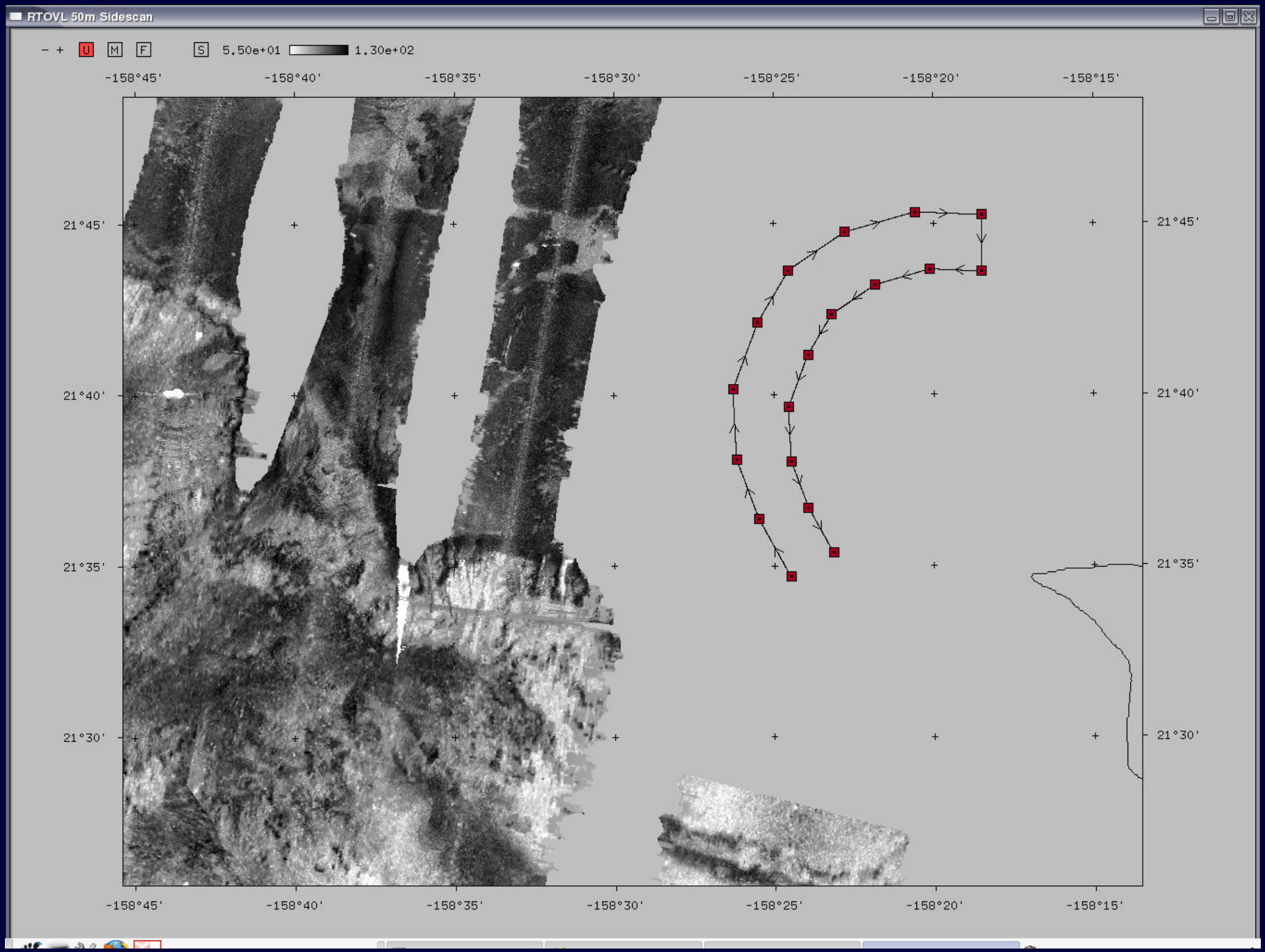
21°35'
21°30'
Append
Insert
Shift / Resize
Fixate
Delete
Reverse
Undo


RTOVL 50m Sidescan
- + U M F S 5.50e+01 1.30e+02
-158°45'
-158°40'
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-158°30'
-158°25'
-158°20'
-158°15'
21°45'
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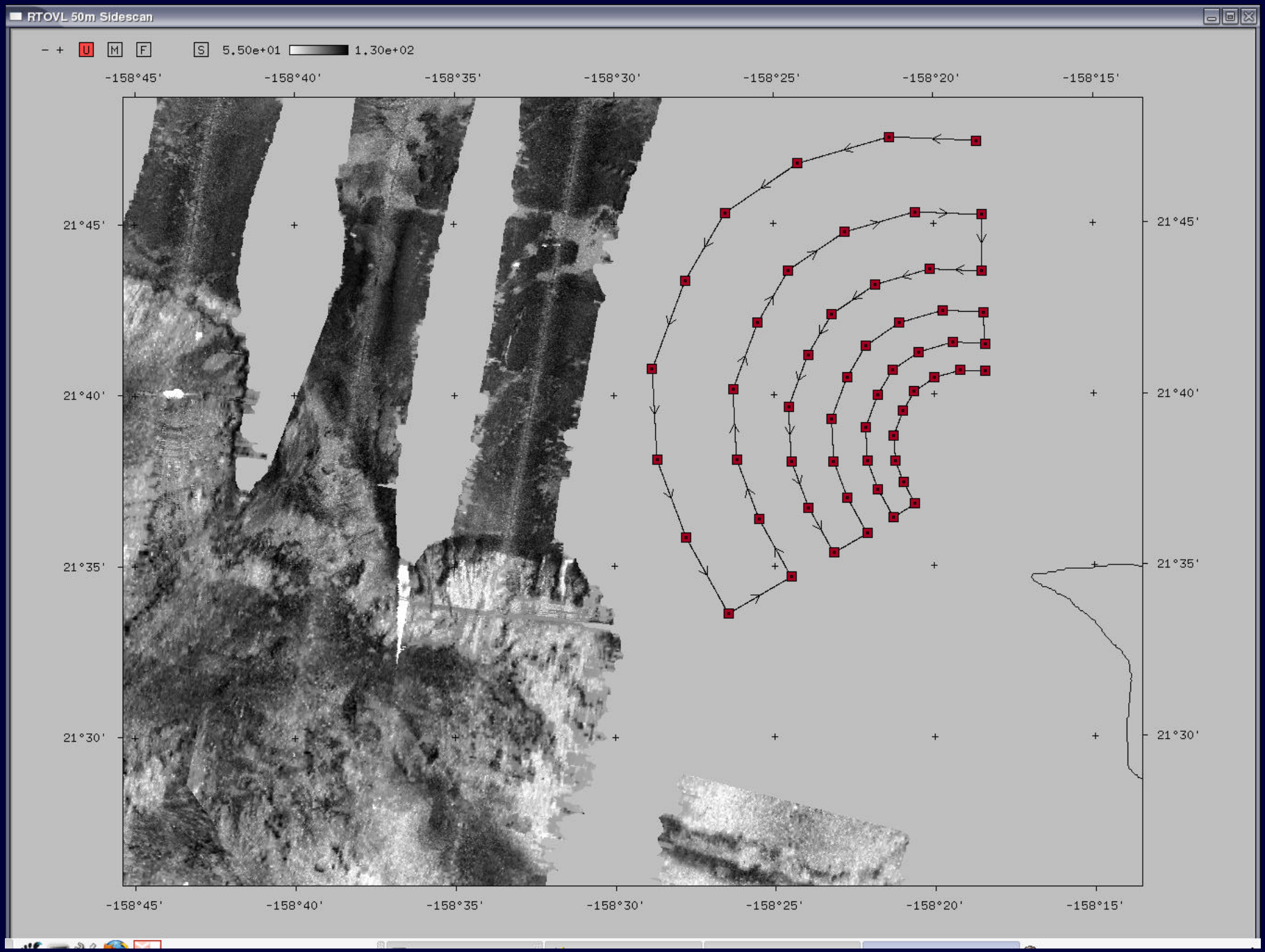
21°30'


RTOVL 50m Sidescan
- + U M F S 5.50e+01 1.30e+02
-158°45'
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21°45'
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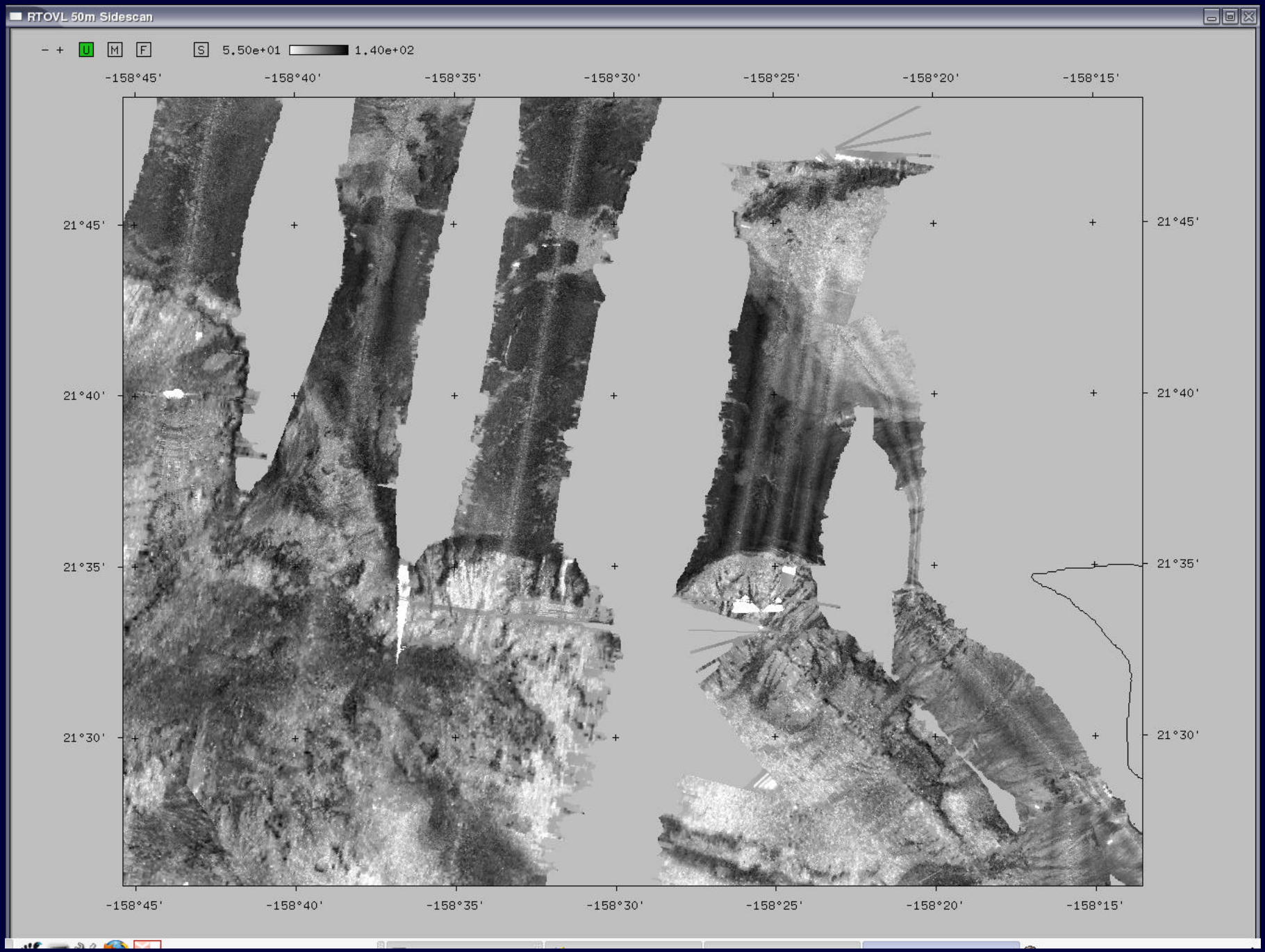
21°35'
21°30'


RTOVL 50m Sidescan
- + U M F S 5.50e+01 1.40e+02
-158°45'
-158°40'
-158°35'
-158°30'
-158°25'
-158°20'
-158°15'
21°45'
21°40'
21°35'
21°30'

Kilo Moana Real-Time Display

- Works on a variety of multibeam & SSBS sonar systems
- Allows science users to interact with multibeam bathymetry and backscatter charts without compromising data acquisition
- See a demonstration of the software in action after talk

Future Plans

- More robust survey planning (waypoint export/import)
- Helm display for better communication with bridge

For More Information

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