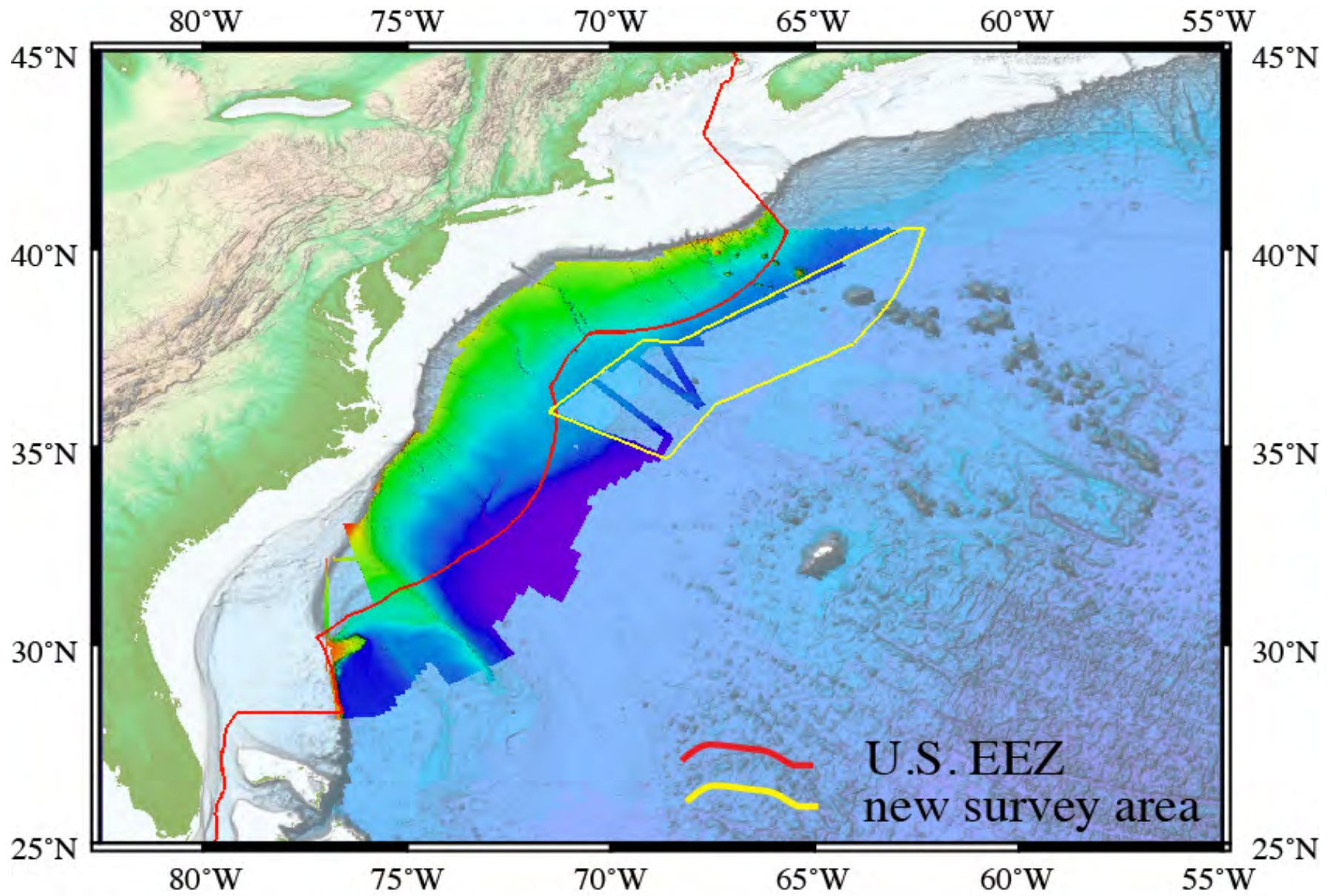
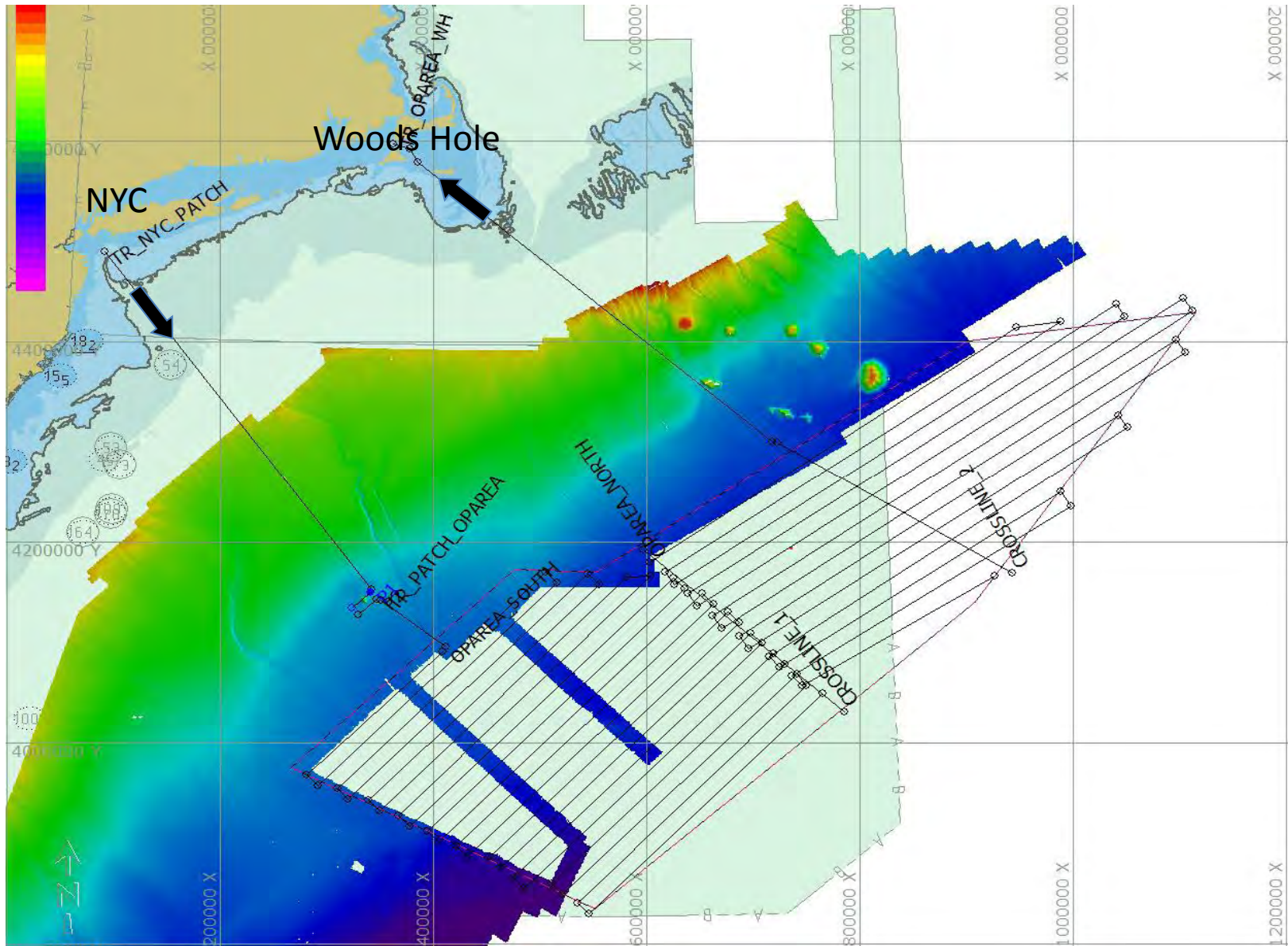


U.S. Law of the Sea Cruise to
Map the Foot of the Slope of the
Northeast U.S. Atlantic
Continental Margin: Leg 8



Brian R. Calder, University of New
Hampshire (Chief Scientist)





planned tracklines

Cruise Calendar

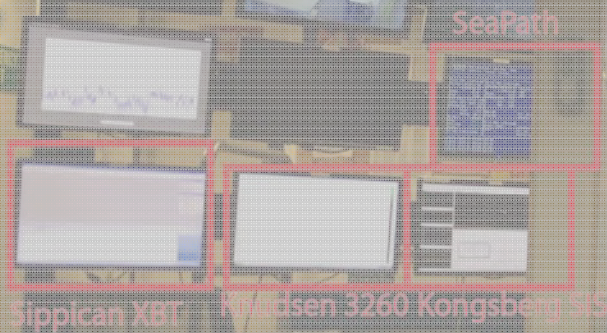
Departed NYC.....30 July
Transit to Patch Test Site.....30-31 July
Patch Test Site..... ..1 August
Commenced MBES Mapping..... ..2 August
Medical Evacuation.....17-19 August
Completed MBES Mapping.....27 August
Transit to Woods Hole.....28-29 August

Cruise Summary

Total Trackline.....10,796 km (5,829 nmi)
Total Area Mapped....157,166 km² (45,822 nmi²)
Total Time Mapping.....24.5 days
Total Transit Time.....2.0 days
Medical Evacuation.....2.0 days

Equipment Used

- Kongsberg Maritime EM122 multibeam echosounder
- Knudsen 3260 Subbottom Profiler
- Bell BGM-3 Gravimeter
- XBT Launch System (XBT, XSV, XCTD)
- Seabird MicroTSG Thermosalinograph



Patch Test Results

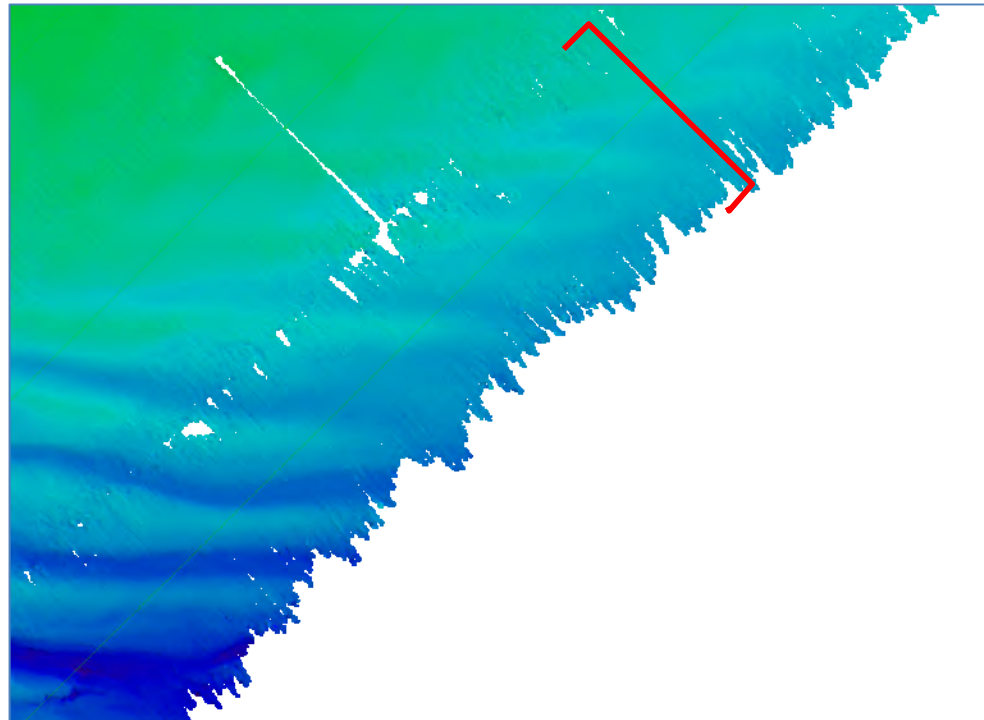
XBT calibrated with XCTD

Patch Test determined no adjustments necessary

Pitch:	-0.23°
Roll:	-0.54°
Yaw:	0.43°
Timing:	0.0 ms

Issues Early On

- Micro SV vs. TSG
- Synchronization of EM122 and Knudsen
- Attitude data served through UDP packets(?)
- bad weather-**bubble sweep**



Seasave - SBE 45 MicroTSG Thermal Salinograph - C:\Documents and Settings\operator\Application Data\Sea-Bird\Seasave\Seasave.psa*

File Configure Inputs... Configure Outputs... Display Real-Time Data Real-Time Control Archived Data Tools Options Help

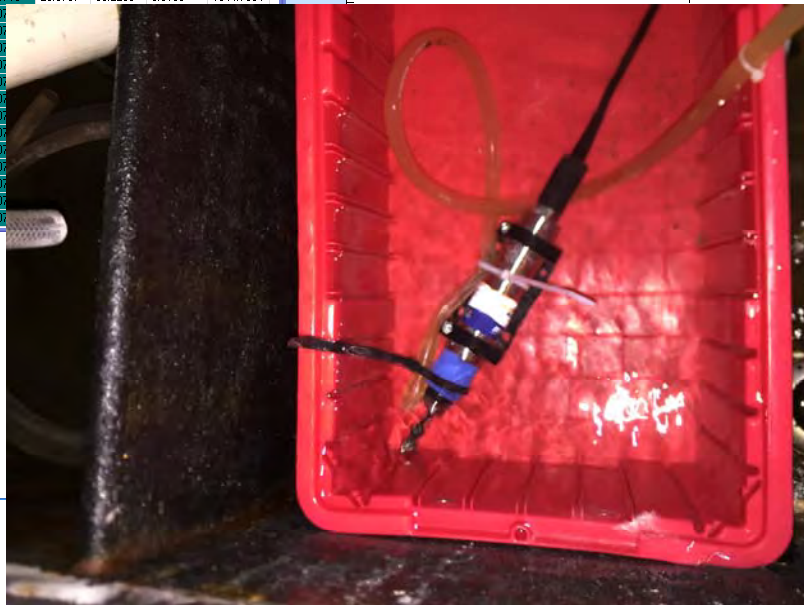
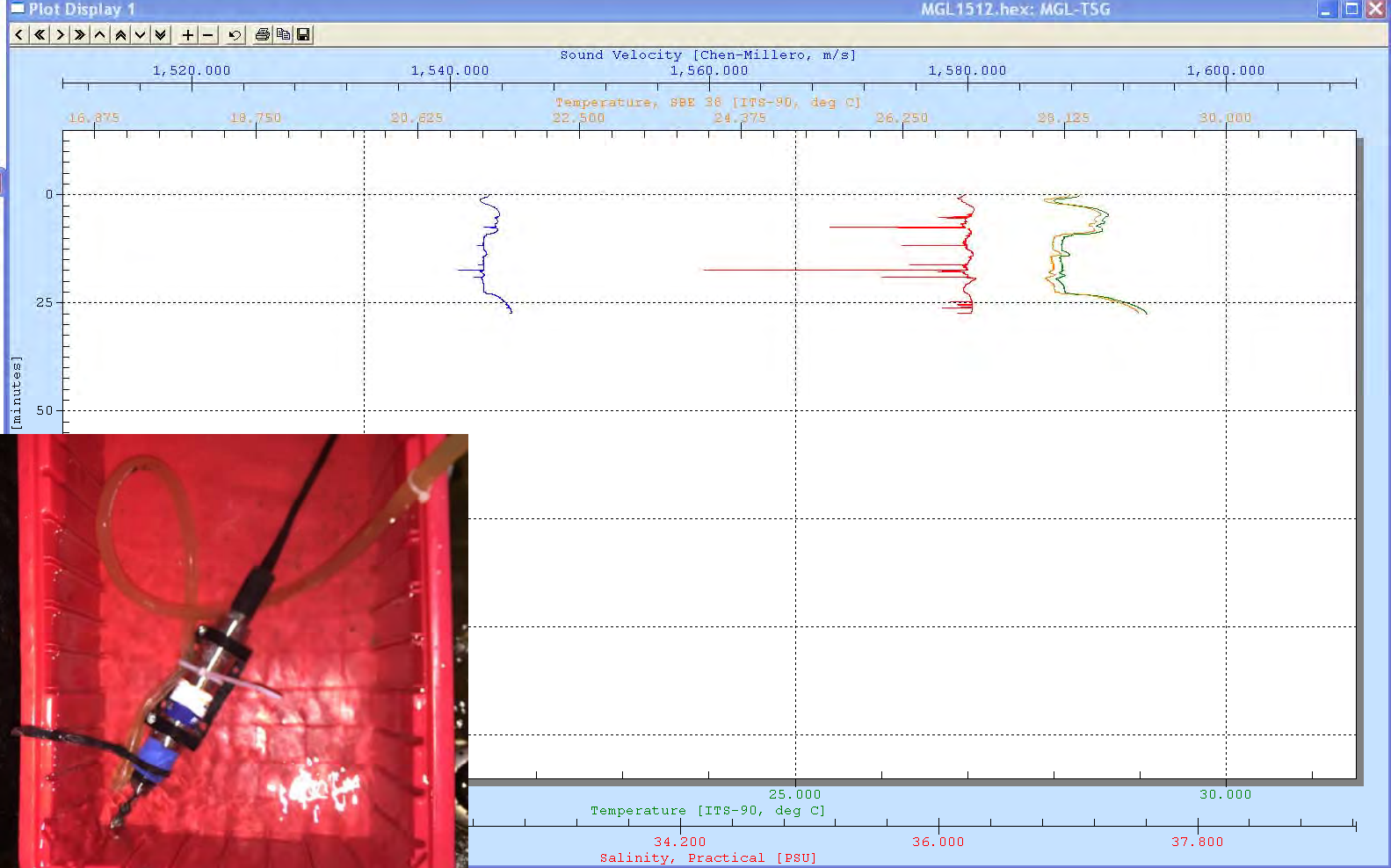
Archiving data to C:\Program Files\Sea-Bird\SeasaveV7\Data\MGL1512.hex MGL-TSG.xmlcon

Fixed Display 1

Temperature, SBE 38 [ITS-90, deg C]	28.97830
Conductivity [S/m]	5.9133000
Salinity, Practical [PSU]	36.21709
Temperature [ITS-90, deg C]	28.07340
Sound Velocity [Chen-Millero, m/s]	1544.732
Scan Count	1660

Scrolled Display 1

scan	t 90 C	t38 90 C	sal	c S/m	svC M
1633	28.0616	28.9712	36.2245	5.9131	1544.7249
1634	28.0621	28.9725	36.2252	5.9132	1544.7285
1635	28.0630	28.9713	36.2252	5.9133	1544.7259
1636	28.0647	28.9717	36.2251	5.9135	1544.7266
1637	28.0647	28.9750	36.2251	5.9135	1544.7337
1638	28.0654	28.9749	36.2248	5.9135	1544.7331
1639	28.0659	28.9732	36.2247	5.9136	1544.7295
1640	28.0657	28.9757	36.2222	5.9133	1544.7321
1641	28.0675	28.9744	36.1992	5.9101	1544.7052
1642	28.0694	28.9779	36.1253	5.8996	1544.6351
1643	28.0685	28.9799	36.1248	5.8995	1544.6388
1644	28.0690	28.9769	36.1837	5.9089	1544.7006
1645	28.0699	28.9820	36.2099	5.9119	1544.7327
1646	28.0706	28.9788	36.2192	5.9133	1544.7356
1647	28.0718	28.9797	36.2200	5.9135	1544.7384
1648	29.0				
1649	29.0				
1650	29.0				
1651	29.0				
1652	29.0				
1653	29.0				
1654	29.0				
1655	29.0				
1656	29.0				
1657	29.0				
1658	29.0				
1659	29.0				
1660	29.0				



Lamont-Doherty Earth Observatory COLUMBIA UNIVERSITY EARTH INSTITUTE		OFFICE OF MARINE OPERATION DOCUMENT	
PREPARED BY: Robert C. Koprowski	EFFECTIVE DATE: 8/26/2015	DOCUMENT NO: Page 1 of 5	
SUBJECT: Kongsberg EM122 Multibeam Synchronization with Knudsen Chirp 3650 SBP Array		REVISION:1.1	

Distribution	Initial
Return To	



LAMONT DOHERTY EARTH OBSERVATORY
OFFICE OF MARINE OPERATION
Kongsberg EM122 Multibeam Synchronization with Knudsen Chirp
3650 Sub-bottom Profiler Array

1.0	First Draft	08/21/2015	RCK
1.1	Second Revision Complete	08/26/2015	RCK
REV	DESCRIPTION	DATE	APPROVED

Lamont-Doherty Earth Observatory COLUMBIA UNIVERSITY EARTH INSTITUTE		OFFICE OF MARINE OPERATION DOCUMENT	
PREPARED BY: Robert C. Koprowski	EFFECTIVE DATE: 8/26/2015	DOCUMENT NO: Page 4 of 5	
SUBJECT: Kongsberg EM122 Multibeam Synchronization with Knudsen Chirp 3650 SBP Array		REVISION:1.1	

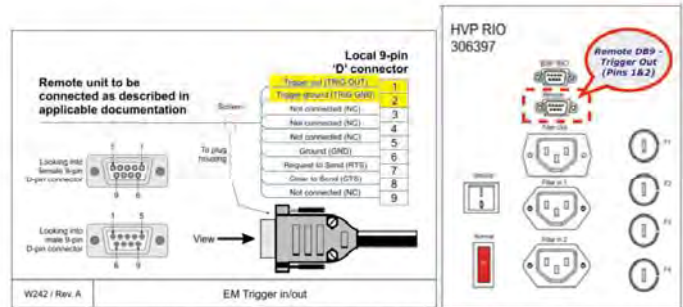


Figure 2.1 – Wiring Diagram Female DB9 Pin out signals and the Remote Connection port

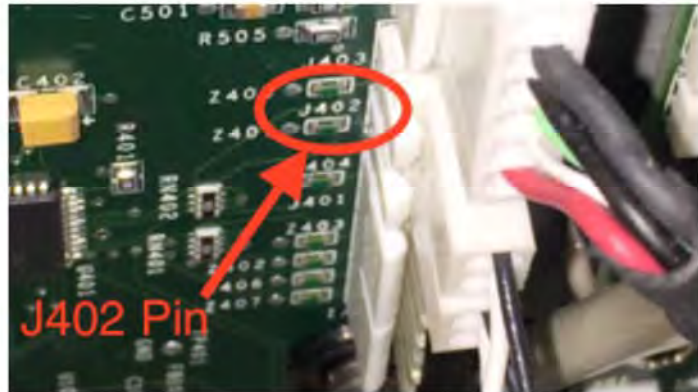
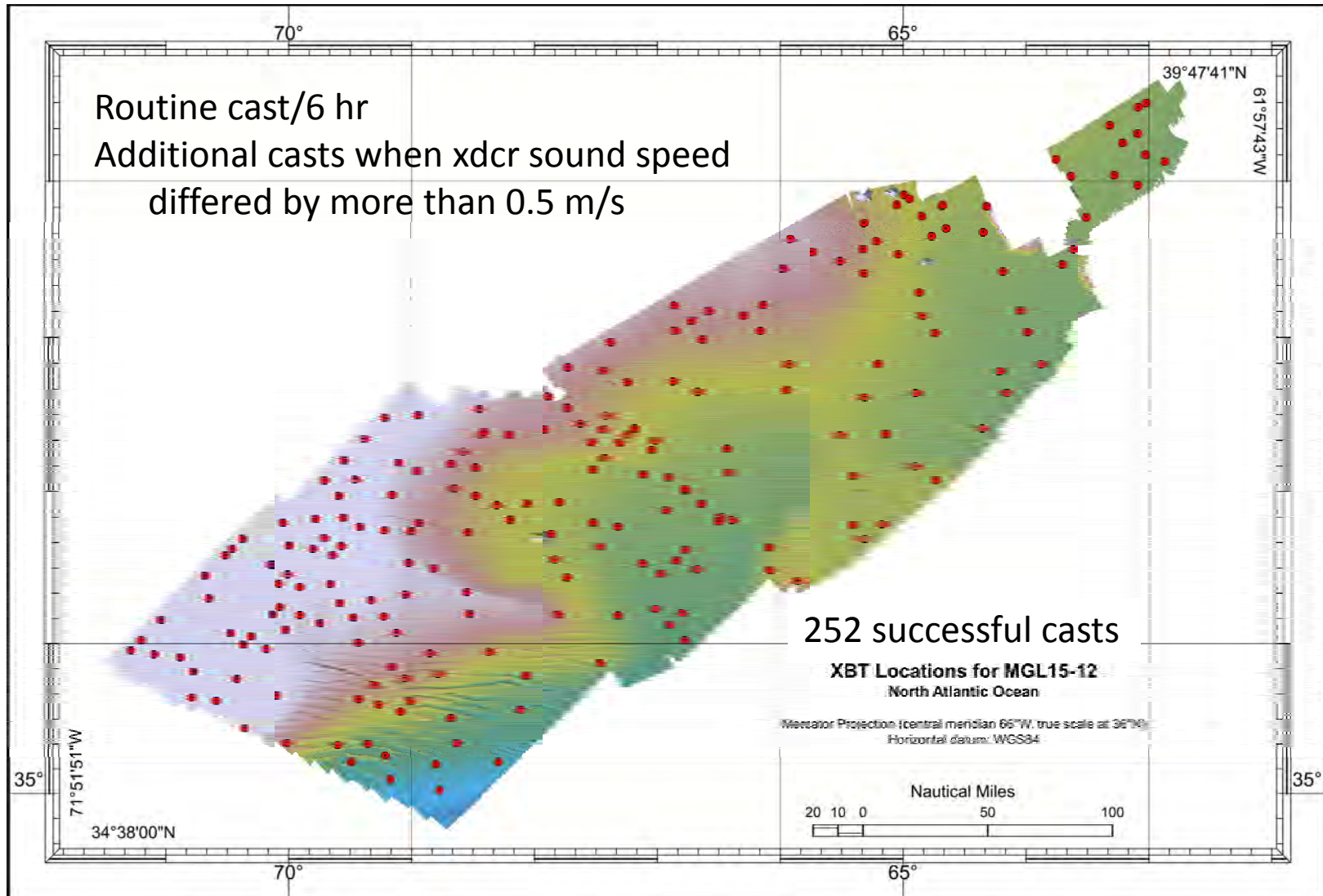
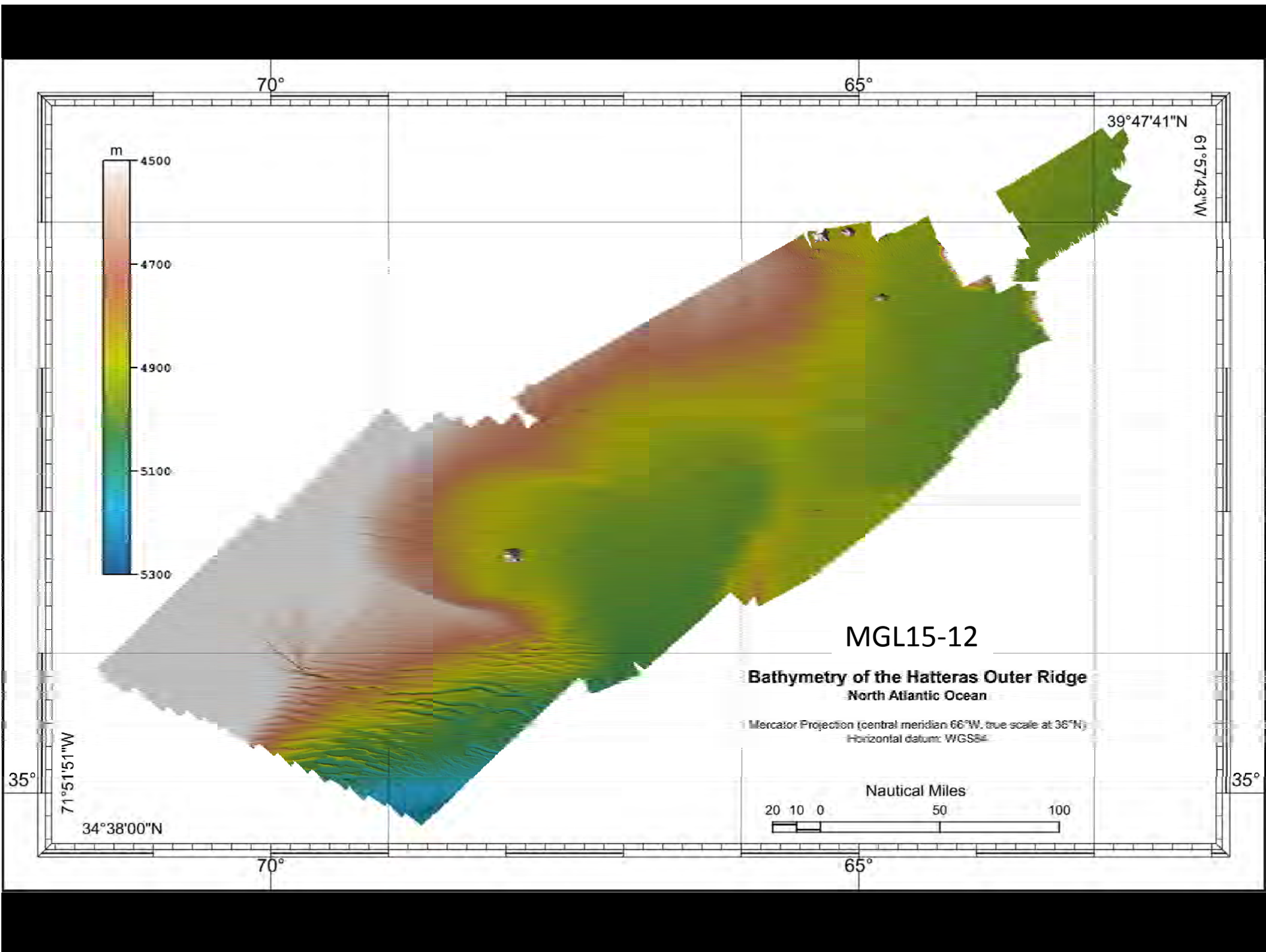


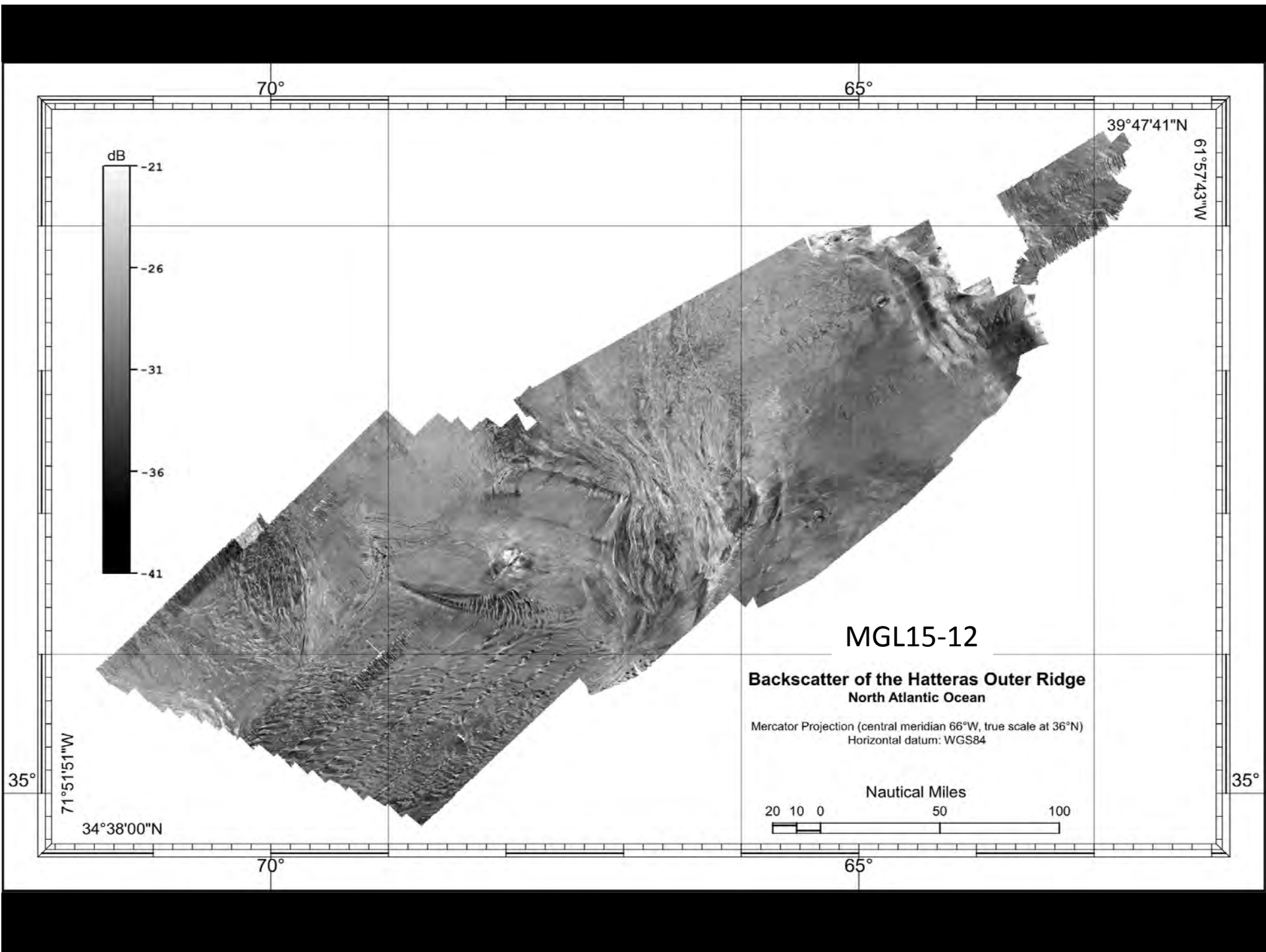
Figure 2.2 – Knudsen Chirp 3650 Processor Module board J402 pins for Aux BNC ports

Date	Time	Type	No.	Disabl.	Message
2015 08 11	12:34:47	3	2501		(PU Sensor) Attitude/Velocity on PU port UDP5 is missing.
2015 08 11	12:34:52	3	722		EM122: Attitude Velocity data not valid for ping
2015 08 11	12:34:57	3	2501		(PU Sensor) Attitude/Velocity on PU port UDP5 is missing.
2015 08 11	12:35:00	122	650		(DDS) Echo sounder EM122_109. Frequency of received AttVel datagrams on PU UDP5 is less than 90% of expected/received (Hz): 90.00/0.00
2015 08 11	12:35:07	3	2501		(PU Sensor) Attitude/Velocity on PU port UDP5 is missing.
2015 08 11	12:35:09	3	722		EM122: Attitude Velocity data not valid for ping
2015 08 11	12:35:17	3	2501		(PU Sensor) Attitude/Velocity on PU port UDP5 is missing.
2015 08 11	12:35:27	3	722		EM122: Attitude Velocity data not valid for ping
2015 08 11	12:35:27	3	2501		(PU Sensor) Attitude/Velocity on PU port UDP5 is missing.
2015 08 11	12:35:37	3	2501		(PU Sensor) Attitude/Velocity on PU port UDP5 is missing.
2015 08 11	12:35:45	3	722		EM122: Attitude Velocity data not valid for ping
2015 08 11	12:35:47	3	2501		(PU Sensor) Attitude/Velocity on PU port UDP5 is missing.
2015 08 11	12:35:57	3	2501		(PU Sensor) Attitude/Velocity on PU port UDP5 is missing.
2015 08 11	12:36:00	122	650		(DDS) Echo sounder EM122_109. Frequency of received AttVel datagrams on PU UDP5 is less than 90% of expected/received (Hz): 90.00/0.00
2015 08 11	12:36:03	3	722		EM122: Attitude Velocity data not valid for ping
2015 08 11	12:42:53	1	205		Checking XYZ: 2 Datagram too small
2015 08 11	13:09:25	3	2503		(PU Sensor) GGA on PU port COM1 is missing.

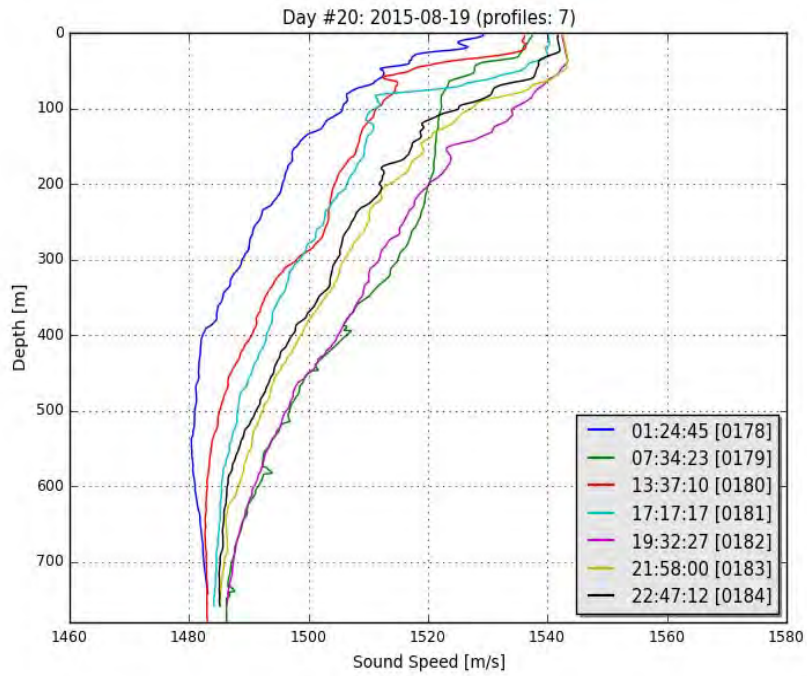
Results



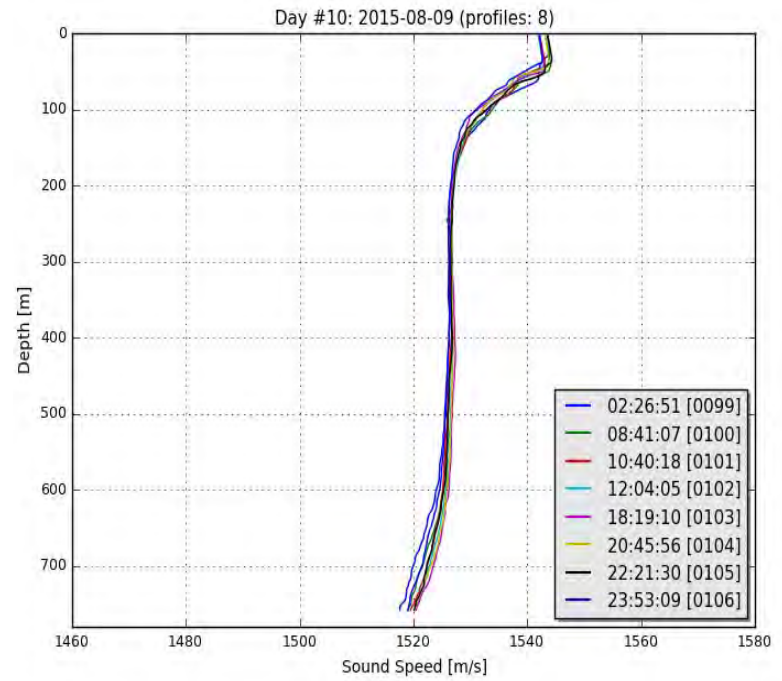




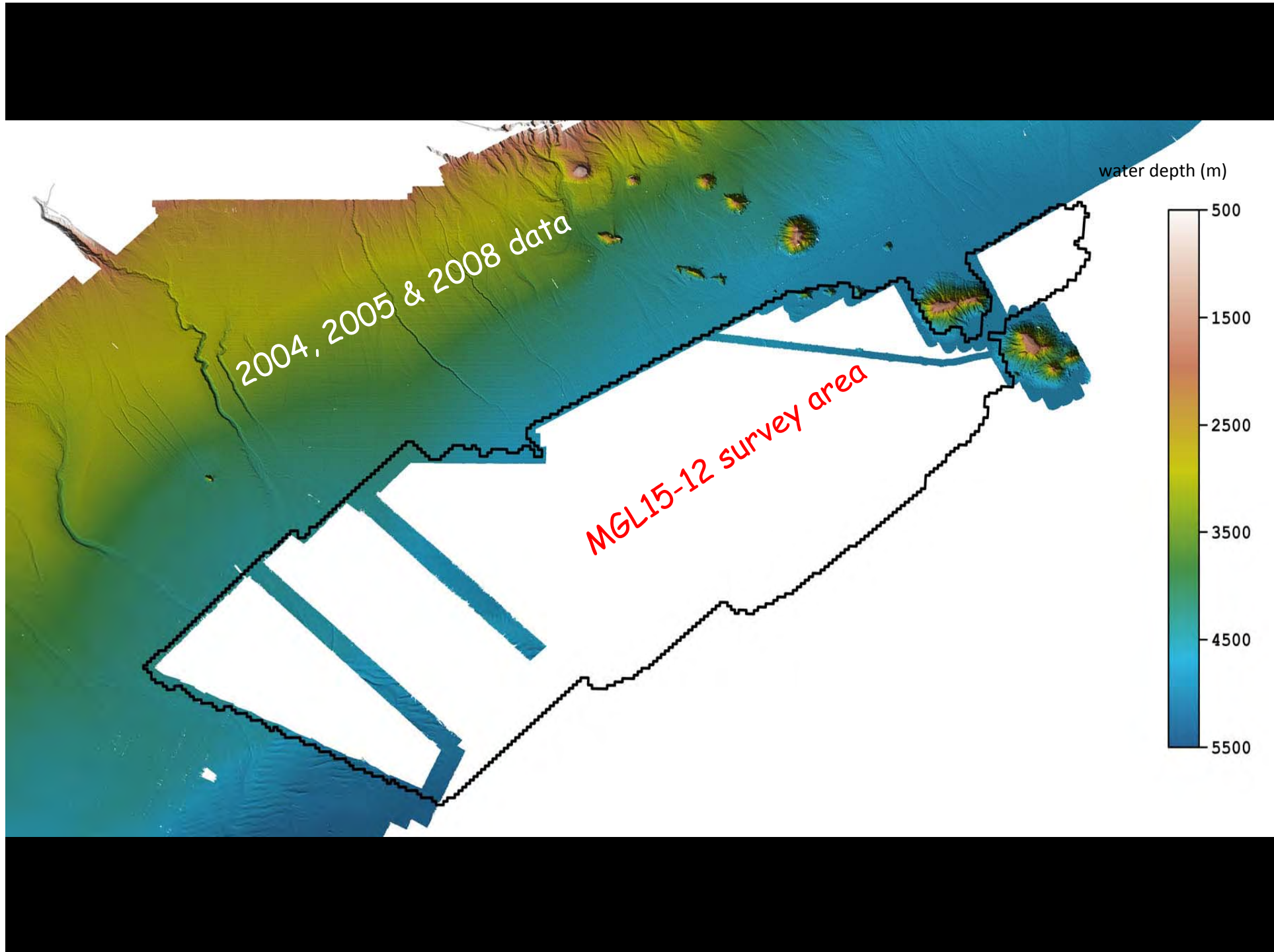
example of daily XBT casts



bad day



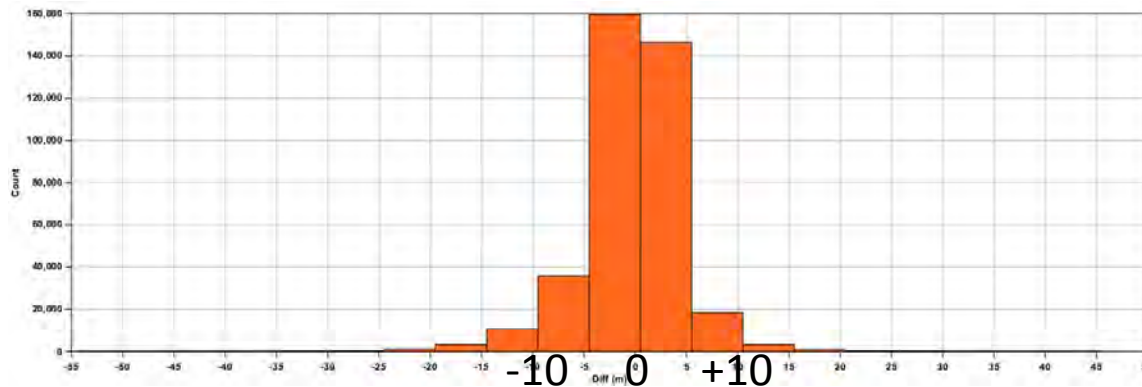
good day



cross-line check of bathymetry precision

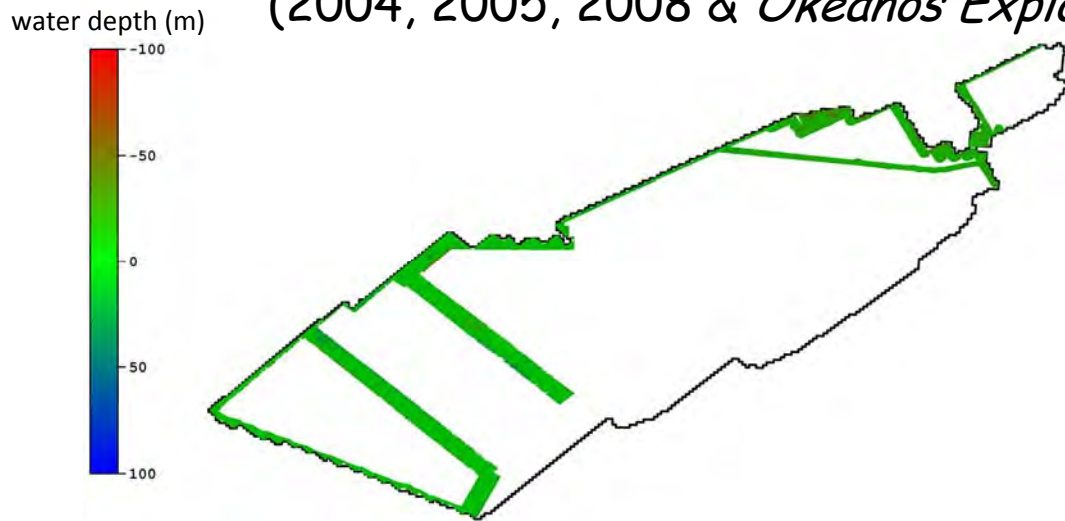


Surface difference (Δ) between main survey area and cross lines. Δ Range from -54 to +45 m, with mean $\Delta = -0.3$ m and $\sigma = 4.7$ m

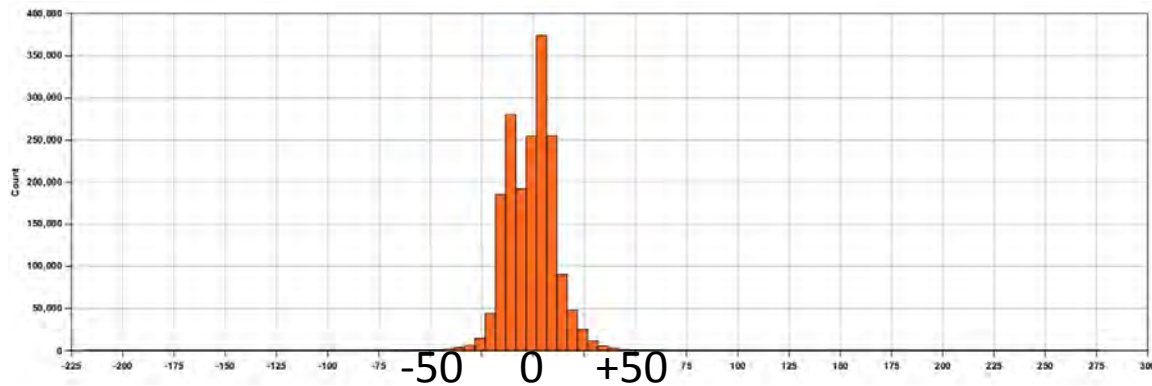


Histogram of surface differences (Δ) between main survey area and cross lines.

cross-line check of bathymetry precision (2004, 2005, 2008 & *Okeanos Explorer*)



Surface difference (Δ) between main survey area and cross lines. Δ Range from -215 to +274 m, with mean $\Delta = -0.8$ m and $\sigma = 11.6$ m



Histogram of surface differences (Δ) between main survey area and cross lines.