
SIO Portable MCS System 2019 Activities

MSROC Winter Meeting 08 Dec 2019

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Scripps Institution of Oceanography

Credit To Geophysical Engineers Kolby Pedrie and Brendon Mendenhall



Core Portable MCS Equipment



Streamer

- 48 channel 12.5m group spacing (2005)
- 48 channel 6.25m group spacing (2018)
- 4 5010 birds

Sound Source

- 3 Sercel GI 210
- Typical 45/105, true GI

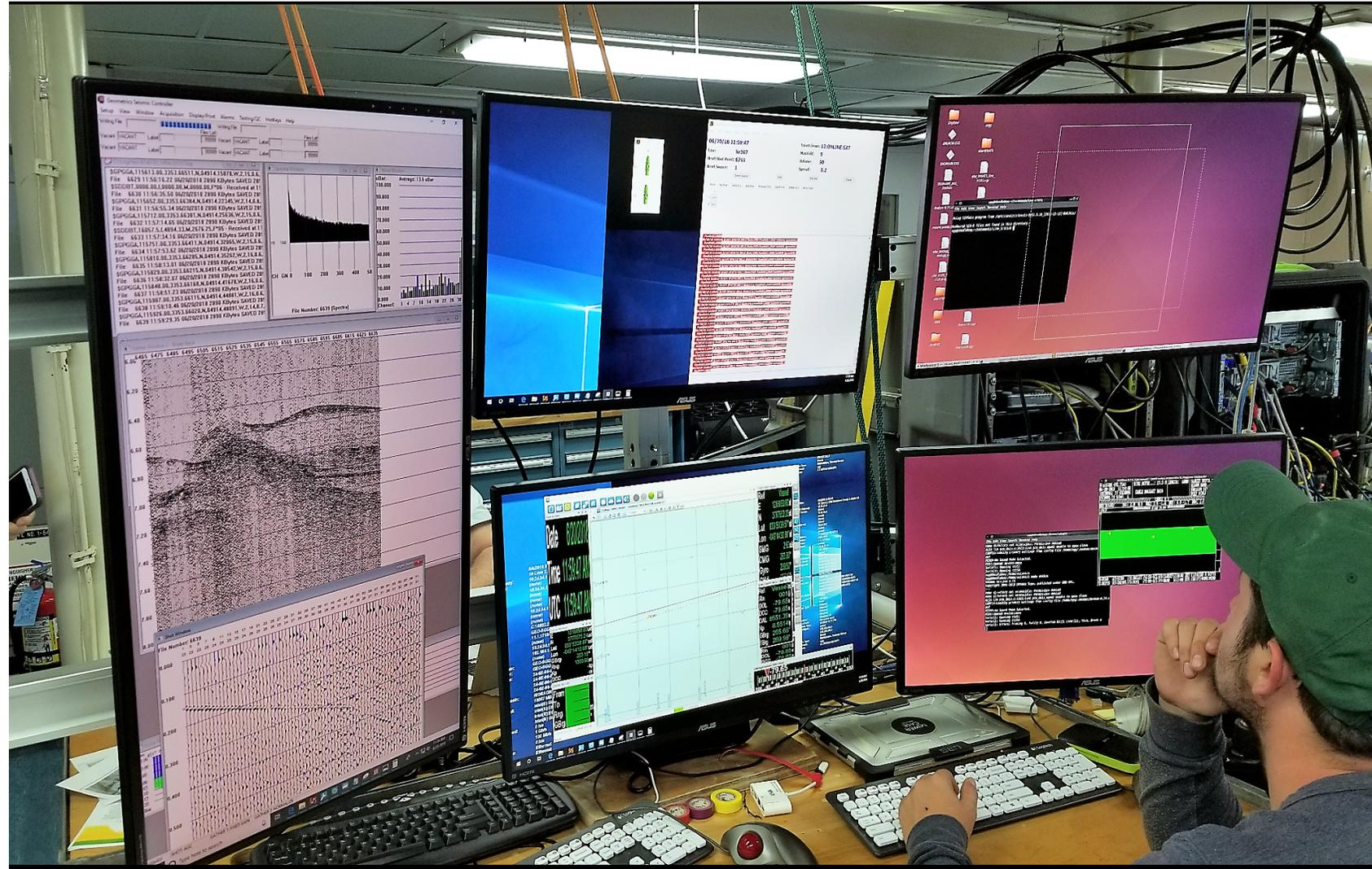


Portable Configuration



Data Acquisition

- Seismic Recorder
- Source Controller
- Navigation
- Realtime SIOSEIS
- Bird Controller



Environmental Compliance



Protected Species Mitigation

- Big eyes
- Night vision devices
- Reticule binoculars



Vessels



R/V Roger Revelle (SIO)

R/V Melville (SIO)

R/V Thomas G. Thompson (UW)

R/V Atlantis (WHOI)

R/V Hugh R. Sharp (UD)

R/V Endeavor (URI)

R/V Wecoma (OSU)

RRS James Cook (NERC)

B/O Francisco de Ulloa (CICESE)

Hydrophone Streamer

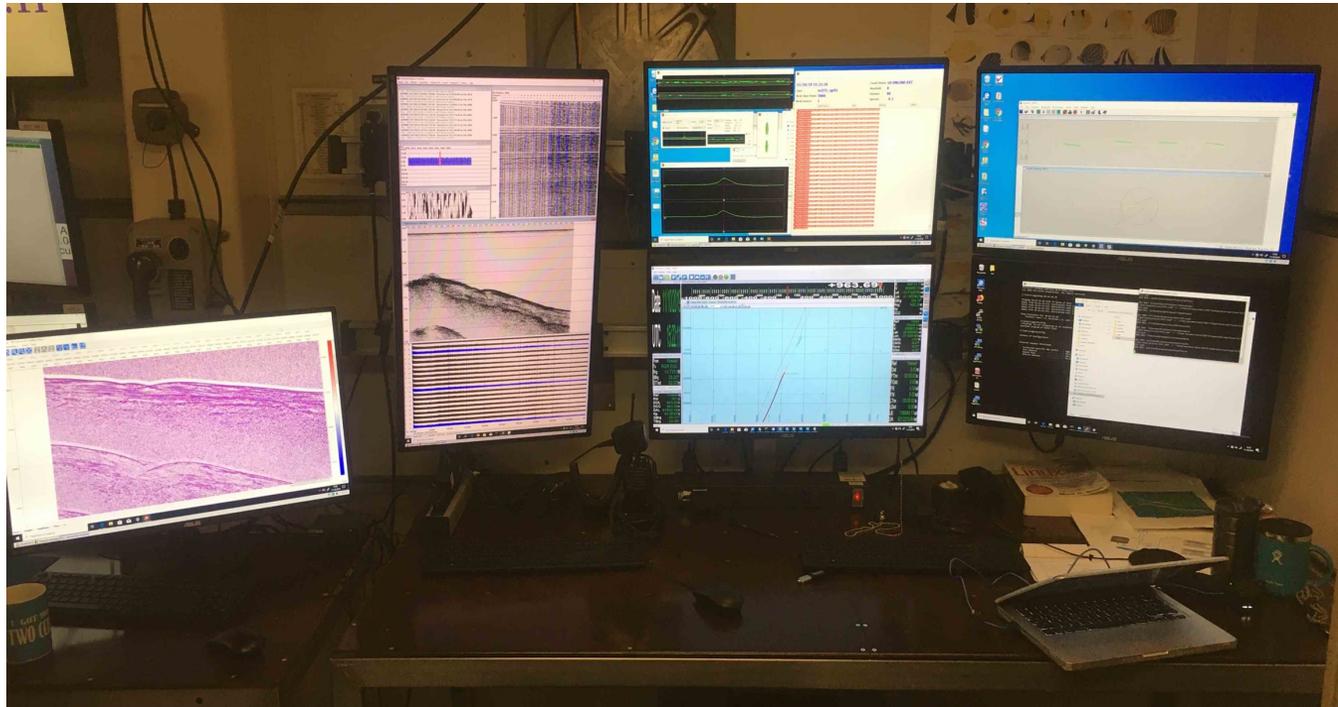
- Geometrics GeoEel Solid
 - 6.25m group spacing
 - Additional 64 Channels, 8 active sections
 - Instrumented repeater module
 - Tail buoy passthrough module
- Digicourse Birds
 - Acquired 5 refurbished 5011 compass birds
 - Acquired refurbished bird controller
- Sercel GI 210 Sound Source



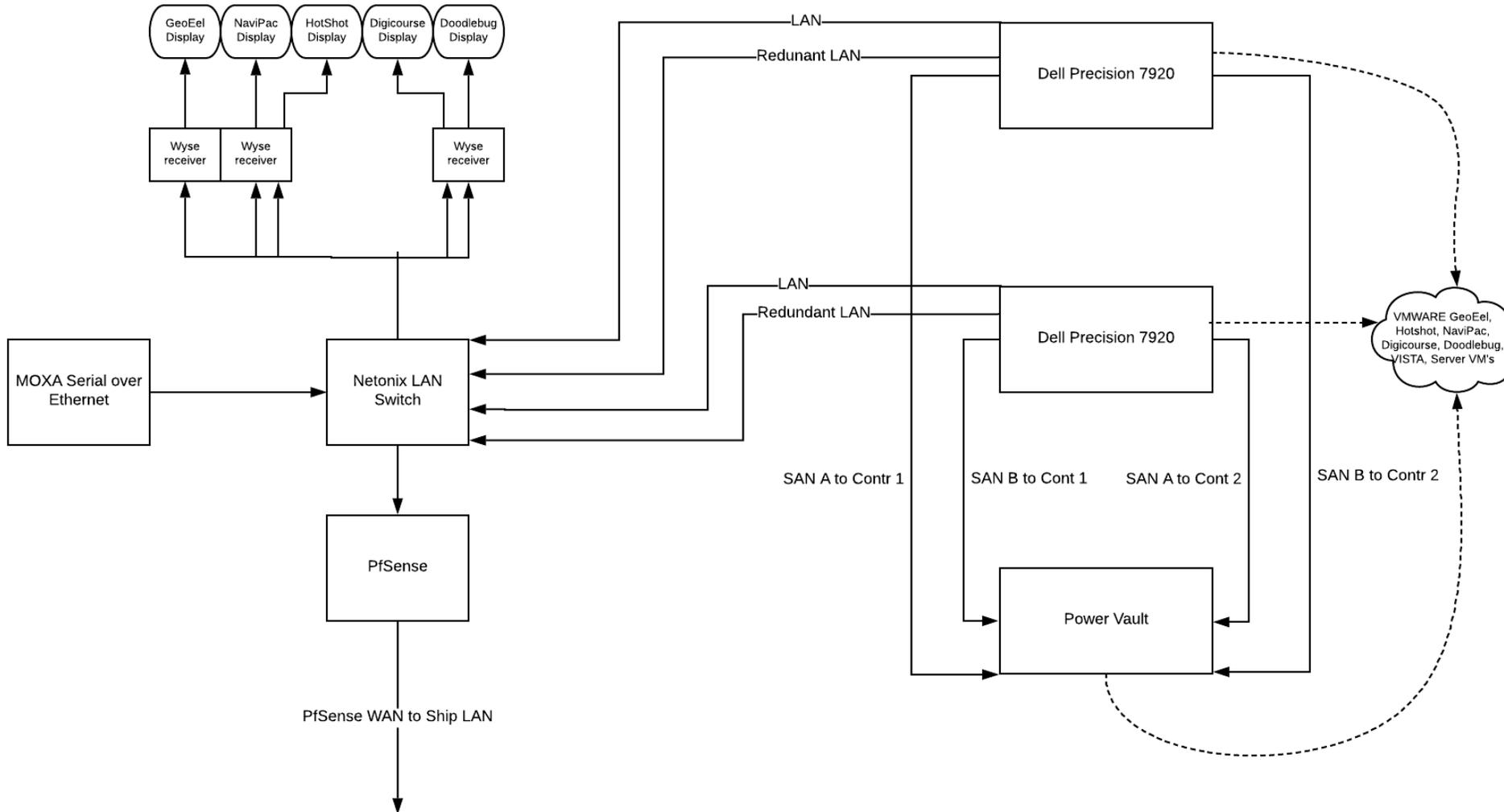
Data Acquisition Advances



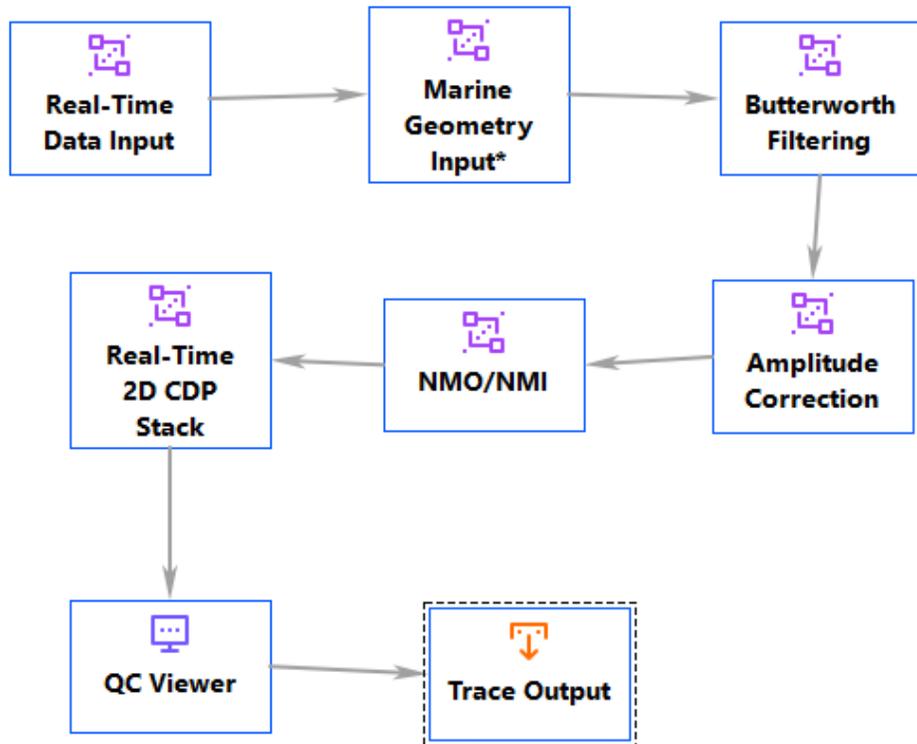
- All acquisition computers now operate as virtual machines on a disaggregated computing cluster
- Upgraded to most recent version of EIVA navigation package
- Purchase of RadExPro marine seismic processing software with real-time QC capabilities



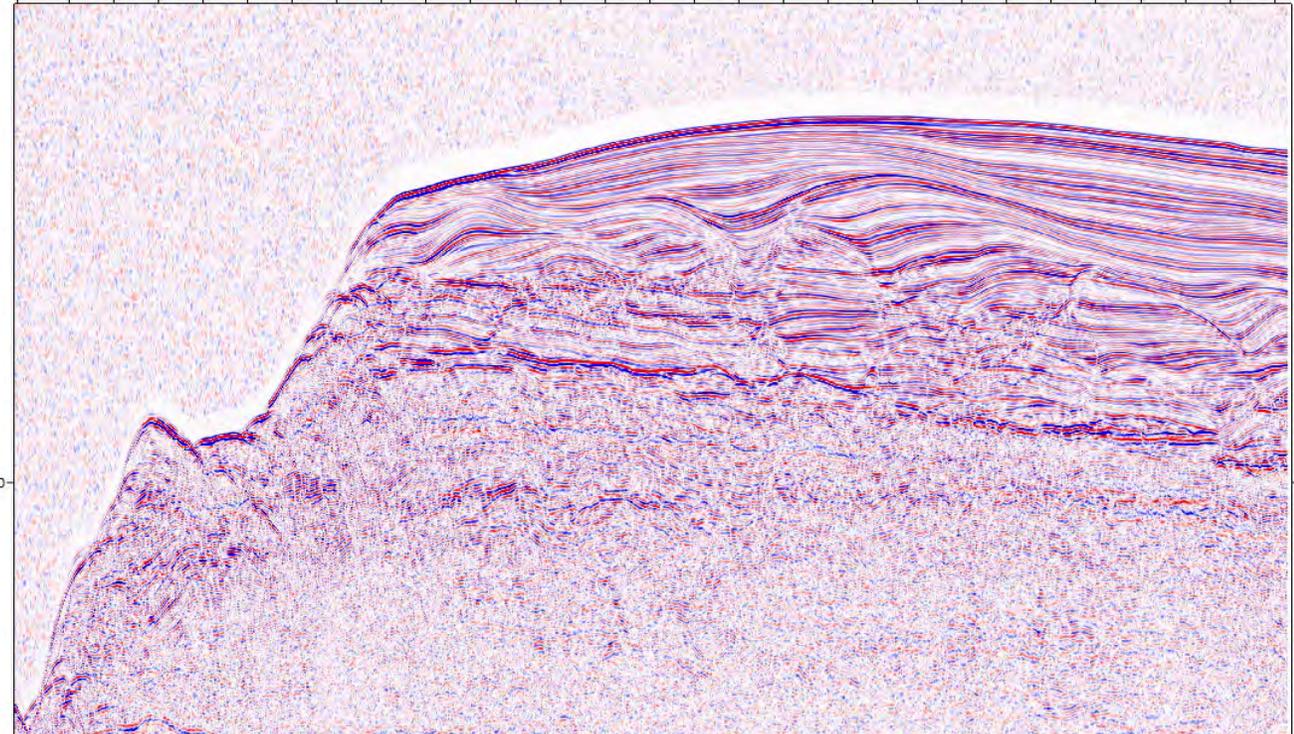
Acquisition Hardware Overview



Improved Realtime QC Processed Stack



CDP 58920 59420 59820 60220 60620 61020 61420 61820 62220 62620 63020 63420 63820 64220 64620 65020 65420 65820 66220 66620 67020 67420 67820 68220 68620
TRACENO 970743 980485 988142 995766 1003950 1012694 1021405 1030116 1038897 1047678 1056389 1065123 1073778 1082522 1091233 1099944 1108725 1117506 1126217 113491
FFID 8357 8407 8451 8494 8538 8582 8626 8669 8713 8757 8801 8844 8888 8932 8976 9019 9063 9107 9151 9194 9238 9282 9326 9369 9413 9457 9501 9544 9588



Portable Rental Compressors



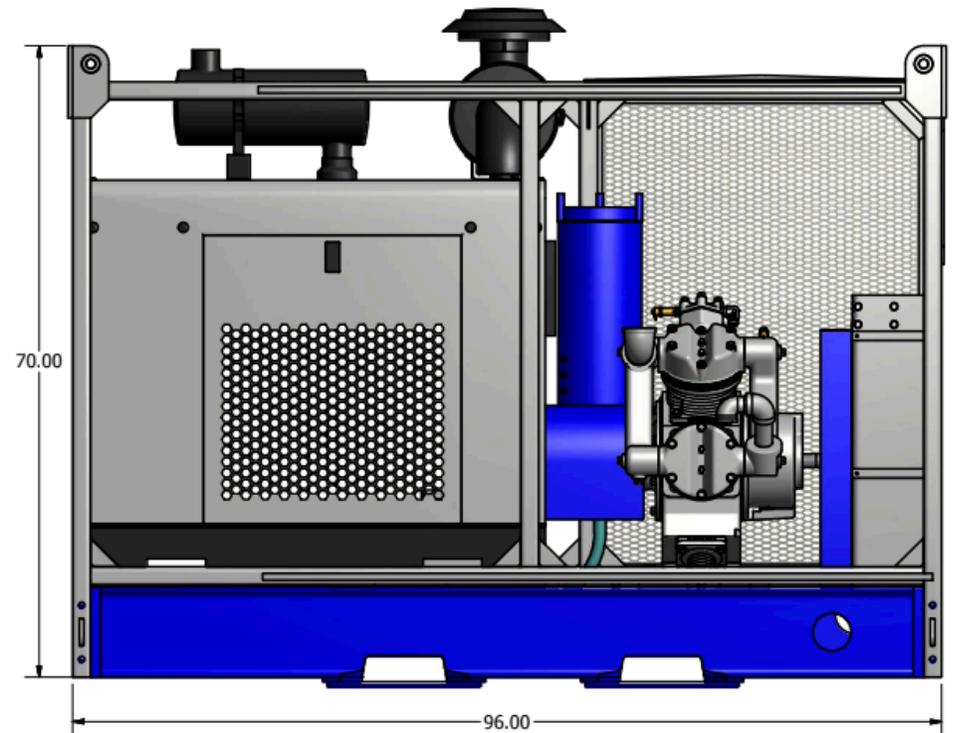
Since 2014 the three UNOLS Global class vessels outfitted with compressors for portable MCS have either been retired or have had the compressors removed

Increased Operational Costs

1. Leases are door to door
2. Additional sea freight costs
3. Spares are leased or additional cost
4. Additional Technical Staff

Technical approach for rental compressors

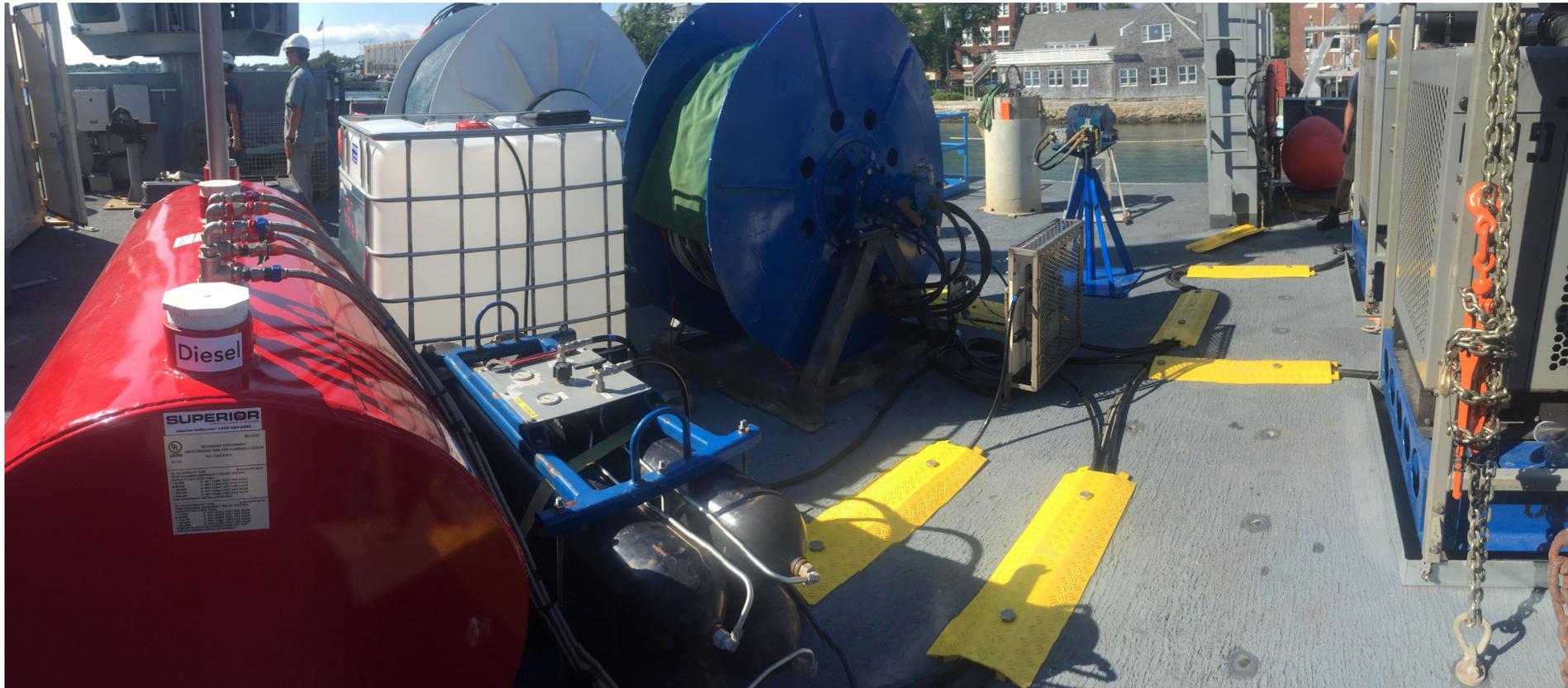
1. Rent a spare compressor (typically 3 total)
2. Include a compressor mechanic and additional technical staff
3. Lease appropriate spares



Portable Compressor Vessel Considerations



- Fueling operations at sea
- Additional noise on deck
- Condensate waste
- On deck hoses and cabling



2019 Operations



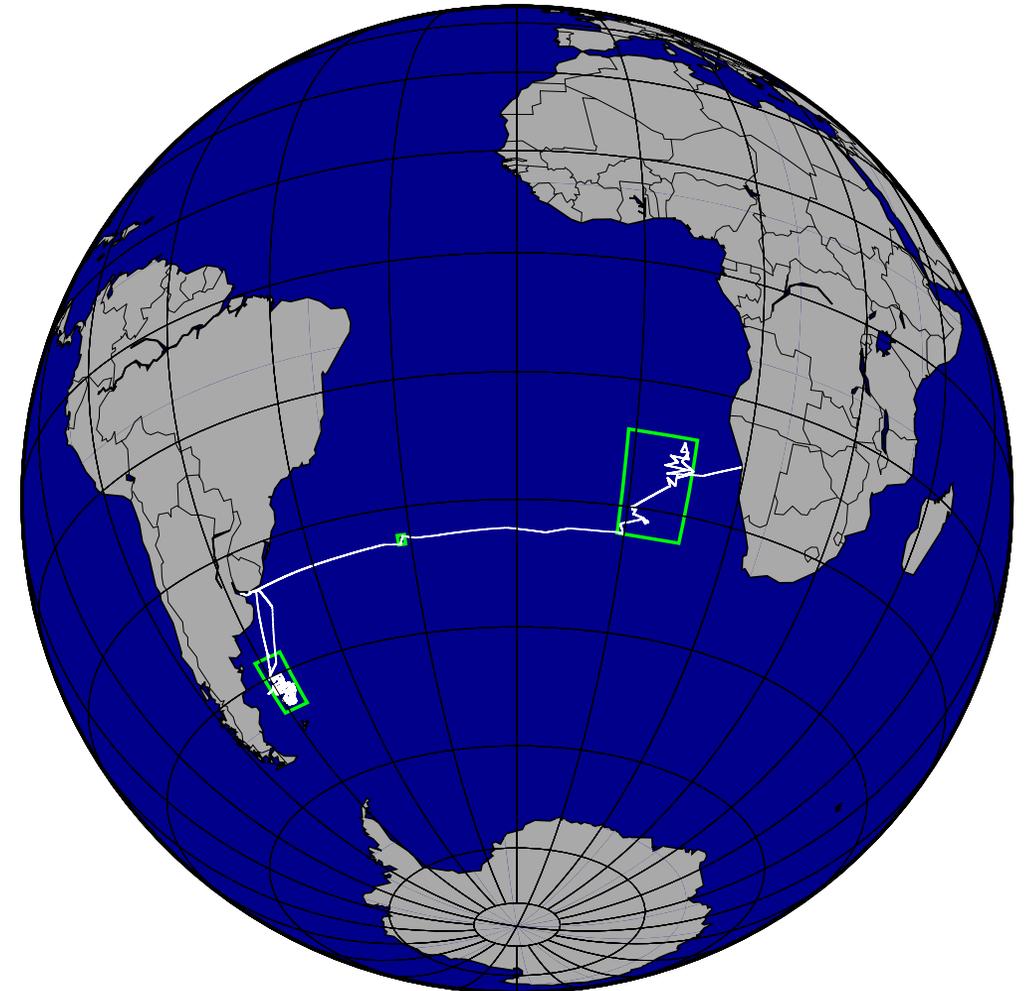
Cruise TN372 R/V *Thomas G. Thompson*

- Chief Scientist Niall Slowey
- ~4,000 line-km of MCS collected over 51 days at sea

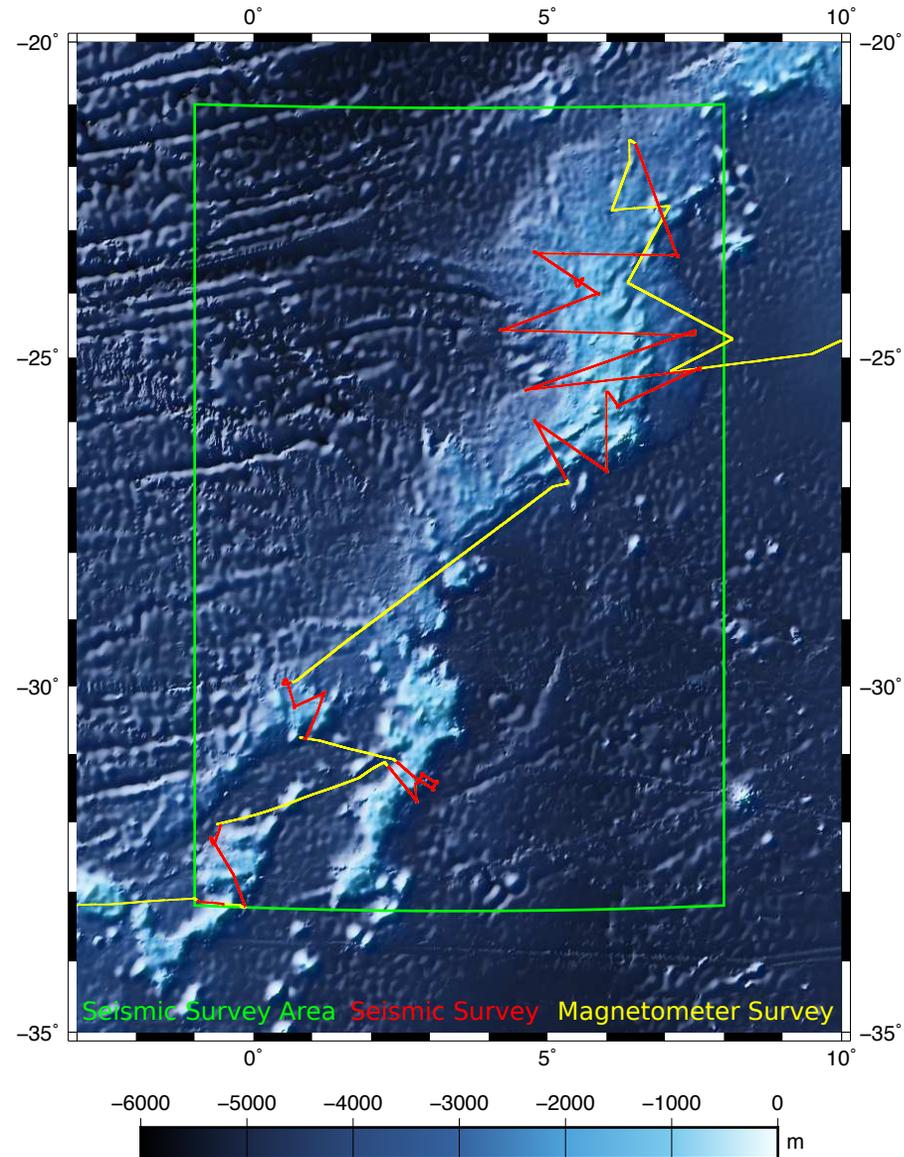
Cruise TN373 R/V *Thomas G. Thompson*

- Chief Scientist William Sager
- ~3,000 line-km of MCS collected over 33 days at sea

MCS Season 2019



Cruise TN373 Walvis Ridge



2019 Operations Lessons Learned



TN372 Equipment Downtime

- Sound Source - ~9hrs (sensor, air leak)
- GeoEel Liquid section failures ~12hrs
- Realtime SIOSEIS acquisition error ~5hrs

TN373 Equipment Downtime

- Dropped navigation feed < 1hr

Other

- Fuel tank pressurization issue resolved at sea
- Compressor cooling system repairs
- Improve magnetometer use/integration
- Evaluate future use of liquid streamer

