Seabed Characterization Workshop

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Data Requirements
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• Impact of water column and sea surface variability
  • Fixed source – multiple fixed receiving array geometry
  • Short and long range
  • Spatially separated water column measurements (thermistor strings)
  • Waverider buoy

• Surface generated noise as ensonifying source
  • Noise fathometry (passive)
  • Drifting arrays (e.g. 16 elements/each)
  • Frequency band ~250 Hz – 2 kHz

• Sloping seafloor
  • Source tows cross-shelf
  • Spatially separated water column measurements (complexity of the cross-shelf region)
SW06 KNORR ship track 08/28/06 (J240) 02:12 -> 08/29/06 (J240) 09:00 GMT

- ENV mooring = red circles
- STR mooring = cyan circles
- acoustic arrays = Green Triangles

Longitude (deg)
Latitude (deg)
Experiment Hardware

MPL Receive Arrays, Source/Receive Arrays, and Towed Sources
• Autonomous Seafloor Receive Arrays (4) - Each Array
  • 16/32-element seafloor VLA with 3.75 m element separation (56.25 m aperture)
    • Other separations easily obtained with new array cables
  • Bandwidth 20/500 Hz – 20/30 kHz (fs = 50/100 kHz)
  • Record duration ~96 hours
  • Autonomous or buoy deployed
  • 2D array configuration feasible (128 elements max)
• Autonomous or Ship–Deployed Source/Receive Arrays (2) – Each Array
  • 8-element VLA with 7.5 m element separation (52.5 m aperture)
    • Separations easily can be modified
  • Bandwidth 10-32 kHz (fs = 100 kHz)
  • Source level 185 dB +/- 4 dB across band
  • Arbitrary waveform transmissions from any or all elements
• Towed Sources
  • ITC-2040X and ITC-1001 in a tow body (3-30 kHz)
  • ITC-2015 (1.5-4 kHz)
  • J-15-1 / J-15-3 (rental)

• Source Tow System
  • Winch
    • Monitor phone and depth sensor (both recorded)
    • Arbitrary waveform synthesis (fs = 100 kHz)
    • Transmit from two sources simultaneously (separate power amplifiers)
• Radio Buoys (2)
  • DSPL batteries (4)
  • 802.11 WLAN connectivity to ship
Autonomous Receive Array
Source-Receive Array
Towed Source System

Winch, Tow Body, and J-15-3 (rental)
Networked Deployment with Communications Buoy

Recording electronics in tower section. 802.11g antenna on top of mast.