The Wire Flyer vehicle system and high resolution hydrographic sections

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Current 1000 meter depth rating

Ship

0.322” or 0.68” cable

Wire Flyer vehicle automatically profiling up and down the cable at controlled speeds between specified depths

Acoustic modem communications

Clump weight (2000 lb)

Sea floor

Glide slope = rise/run

Flight path

Example data

Acoustic altimeter
Modem interface

Flyer Depth: 793.2 m

Battery
- 74% (15.6 v)

Last Uplink: 22
Missed Downlinks: 0
Downlink Received

Vehicle and Clump Depth History (Right Click: Resume Auto-Scroll)

Depth Plots
- Depth (m)

GMT Time (x1e+09)
- 03:26:40 03:43:20 04:00:00 04:16:40 04:33:20

Turbidity
- Chlorophyll
- Distance plots
- Oxygen
- Salinity
- Ship Location
- Temperature
Typical mission

Example profile

- Clump depth
- Flyer depth

8 hours
Looking for seep related water column features, Costa Rica margin

Mound 12
Turbidity

Oxygen

Oxygen minimum

Latitudinal Gradient

Longitude Gradient

Quepos Slide

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OMZ Wire Flyer Transect with MOCNESS
Zooplankton Sampling

**MOCNESS**
- 1 m², 222 µm mesh
- Sea-Bird SBE911plusCTD SBE43 oxygen sensor
- **Horizontal**
  - 8 nets same depth
- **Vertical** (8 or 9 nets)
  - Day Night
  - 0-1000, 0-350, 350-650, 600-800, oxycline tracking

**Tucker Trawls**
- 3 m² mouth
- 100 m long
- Insulated cod end
- CTD sensors
- Long tows at depth
Zooplankton Variability and Oxygen (425 m)

Oxygen (µM)

Distance (km)

High Ox
8 µM, 0.18 ml/L
5 µM, 0.11 ml/L

Low Ox

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Zooplankton Abundance and Oxygen (425 m)

- Copepod: *Pleuromamma abdominalis*
- Total Euphausiids
- Fish: *Cylotheta spp.*

Abundance (###/1000 m$^3$) vs. Distance (km)
Wire Flyer Transect with MOCNESS 726
Zooplankton Variability and Oxygen (430 m)

Oxygen (µM) vs. Distance (km)

High Ox
Low Ox

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Wire Flyer Transect with MOCNESS 728

The image shows a graph with depth on the y-axis (in meters) ranging from 0 to 900 and distance on the x-axis (in kilometers) ranging from 0 to 50. The color scale indicates oxygen concentration, with values ranging from 0 to 20 μmol/L. The graph likely represents data collected during a wire flyer transect with MOCNESS 728.
Zooplankton Variability and Oxygen (800 m)

![Graph showing oxygen levels along distance](image)

- **High Ox**
- **Low Ox**

Distance (km)

Oxygen (µM)

0 4 8 12
0 1 2 3 4 5 6 7 8
Side-looking acoustics

- EK80 echosounder with 70 kHz and 200 kHz frequencies