

R/V Revelle - Cruise Plan - June 10-15, 2003  
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### **General Summary**

Principal Purpose - Recover three instrumented sub-surface moorings in the Kauai Channel between Oahu and Kauai (daytime recoveries).

Secondary Purposes - (i) Acquire 12-hour time series of CTD profiles and deep water velocity profiles (with 50/140 ADCPs) at each of the three mooring sites;

(ii) calibration of Sea-Bird instruments with CTD;

Mooring Site Names and Locations:

A2: 21 45.14 N, 158 45.42 W;

C2: 21 38.06 N, 158 51.60 W;

D2: 21 52.01 N, 158 25.00 W;

[see blue dots on attached map for locations];

[see abridged mooring designs at end of this document].

Equipment requirements summary:

mooring winch (minimum rating - 2,000 lbs);

CTD (max. 50 profiles w/ 21 water samples total for salinity);  
50/140 ADCPs;

wide mouth traveling block on aft A-frame;

grappling hook & snap hook on pole for mooring recovery;

dragging gear (as a backup for mooring release failure).

Deck Loading on June 10: 4 wooden boxes & 5 wire baskets for 84 glass balls.

12 wooden spools for ~5600 m of 1/4" wire (weight of recovered wire will be ~ 1800 lbs.)

2 tires for 37" and 49" ADCP syntactic floats (in air, spheres weigh 410 lbs & 1121 lbs, respectively).

### **Day-to-Day Cruise Plan (All Times in Hawaiian Standard Time)**

June 10, 16:00 - Depart Honolulu.

Steam to mooring site A2, approx. 60 n.m. from Honolulu:

A2 position: 21 45.14 N, 158 45.42 W.

22:00 - Arrive at A2; stand off 0.7 n.m.  
Deploy transponder on 10m cable; wake up A2's acoustic release.  
Do acoustic triangulation of A2's position (ranging from 3  
different ship positions around A2).  
Recover transponder.

June 10, 23:30 - Begin acquiring CTD's; "Yo-Yo" protocol; that is, acquire a  
set of full-depth CTD's (depth ~ 1300m), one after the  
other without bringing CTD on deck. Each down-and-back  
CTD will have a separate cast number. During last up-cast,  
collect 3 water samples at different depths for salinity  
calibration check.

June 11, 11:30 - End CTD's; should have acquired ~ 15 down-and-back CTD's.  
Deploy transponder on 10m cable.  
Send "release" signal to A2's acoustic release.  
A2 is a full-depth (1200 m) mooring (see attached mooring design);  
top float is just 100m below surface, so only a few minutes will  
elapse before 49" orange syntactic foam sphere reaches surface.  
Recover transponder after sighting sphere.  
Approach and recover mooring.

16:00 - End mooring recovery; steam to mooring site C2 (~ 10 n.m.)  
C2 position: 21 38.06 N, 158 51.60 W.

17:00 - Arrive at C2; stand off 1.3 n.m.  
Deploy transponder on 10m cable.  
Wake up C2's acoustic release; do range/depth check.  
Recover transponder.

17:30 - Begin acquiring CTD's; "Yo-Yo" protocol; (depth ~ 4050m).

June 12, 07:30 - End CTD's; should have acquired ~ 6 down-and-back CTD's.  
Deploy transponder on 10m cable.  
Send "release" signal to C2's acoustic release.  
C2 is a full-depth (3950 m) mooring (see attached mooring design);

top float is just 100m below surface, so only a few minutes will elapse before 37" orange syntactic foam sphere reaches surface.  
Recover transponder after sighting sphere.  
Approach and recover mooring.

16:00 - End mooring recovery; steam to mooring site D2 (~ 30 n.m.)  
D2 position: 21 52.01 N, 158 25.00 W.

19:00 - Arrive at D2; stand off 1 n.m.  
Deploy transponder on 10m cable.  
Wake up D2's acoustic release; do range/depth check.  
Recover transponder.

June 12, 19:30 - Begin acquiring CTD's; "Yo-Yo" protocol; (depth ~ 2400m).

June 13, 07:30 - End CTD's; should have acquired ~ 8 down-and-back CTD's.  
Deploy transponder on 10m cable.  
Send "release" signal to D2's acoustic release.  
D2 is a short (250 m) mooring (see attached mooring design).  
Track release as it rises; 40-60 minutes for yellow-jacketed glass balls to reach surface.  
Recover transponder after sighting glass ball hard hats.  
Approach and recover mooring.

11:00 - End mooring recovery.

11:30 - Begin acquiring CTD's; "Yo-Yo" protocol; (depth ~ 2400 m).

June 14, 08:30 - End CTD's; should have acquired ~ 15 down-and-back CTD's.  
Prepare calibration CTD casts for recovered Sea-Bird instruments.  
Attach cables to CTD frame for loading instruments.  
Attach 17 instruments (SBE 16 & 37) to cables.  
Execute CTD to 1000 m with 3 stops going down for full equilibration; 3 water samples on up-cast.  
Remove 17 instruments and attach remaining 16 SBE 37 inst.  
Execute 2nd CTD to 1000m with 3 stops & 3 water samples.

June 14, 13:00 - End Calibration CTDs. Remove instruments/cables from CTD frame.

14:00 - Begin acquiring CTD's; "Yo-Yo" protocol. Location TBD.

June 15, 02:00 - End CTD's. Proceed to Honolulu (< 68 n.m.)

08:00 - Arrive Honolulu

## **A2 Mooring Design (Abridged)**

### Depth

100.00 m - top of 49" floatation sphere, excluding frame height, holding:

300 kHz ADCP looking up

T sensor included in ADCP

OSU's Seimac CML in pocket in float

102.04 m - 2 m of 1/2" LL chain

104.30 m - begin 104m of 1/4" JWR

208.54 m - begin 104m of 1/4" JWR; 2 clamp-on instruments

312.80 m - 5 lengths of 2m 3/8" chain, each with 2 glass balls in hard hats

324.21 m - begin 104m of 1/4" JWR; 3 clamp-on instruments

428.45 m - begin 104m of 1/4" JWR; 5 clamp-on instruments

532.69 m - begin 104m of 1/4" JWR

636.93 m - begin 104m of 1/4" JWR; 7 clamp-on instruments

741.17 m - 170 lb baffle (2' wide) with 8m of 1/2" chain

749.41 m - OSU 75 KHz RDI LongRanger ADCP in cage; includes T & P sensors;  
751.88 m - 2m of 1/2" LL chain  
754.12 m - 6 lengths of 2m 3/8" chain, each with 2 glass balls in hard hats  
767.99 m - begin 540m of 1/4" JWR; 22 clamp-on instruments  
1308.23 m - 170 lb baffle (2' wide) with 8m of 1/2" chain  
1316.47 m - OSU 75 KHz RDI LongRanger ADCP in cage; includes T & P sensors;  
OSU MTR T - attached to LongRanger  
1318.94 m - 2m of 3/8" SL chain  
1321.20 m - two 1m pieces of 3/8" SL chain - one for each release - in parallel  
1322.25 m - two Benthos releases in parallel - OSU MTR T - attached to release

## **D2 Mooring Design (Abridged)**

### Depth

2102.41 m - 4 lengths of 2m 3/8" chain, each with 2 glass balls in hard hats  
2111.48 m - 2m of 3/8" chain  
2113.48 m - 4 lengths of 2m 3/8" chain, each with 2 glass balls in hard hats  
2122.90 m - begin 104m of 1/4" JWR; 4 clamp-on instruments  
2227.14 m - begin 104m of 1/4" JWR; 7 clamp-on instruments  
2331.20 m - 2m of 1/2" LL chain  
2333.44 m - 25 lb (1' wide) baffle with 4m of 3/8" chain  
2337.68 m - 300 kHz RDI Sentinel ADCP in cage; includes T sensor;  
2338.94 m - 2m of 3/8" SL chain  
2341.18 m - two Benthos releases in parallel

## **C2 Mooring Design (Abridged)**

### Depth

100.00 m - top of 37" floatation sphere, excluding frame height, holding:  
300 kHz ADCP looking up  
T sensor included in ADCP  
ARGOS transmitter in pocket in float  
101.25 m - 2 m of 1/2" LL chain  
103.51 m - begin 104m of 1/4" JWR; no instruments

207.76 m - begin 104m of 1/4" JWR; 2 clamp-on instruments  
311.76 m - 5 lengths of 2m 3/8" chain, each with 2 glass balls in hard hats  
323.44 m - begin 104m of 1/4" JWR; 2 clamp-on instruments  
427.44 m - 3 lengths of 2m 3/8" chain, each with 2 glass balls in hard hats  
434.63 m - begin 104m of 1/4" JWR; 5 clamp-on instruments  
538.88 m - begin 104m of 1/4" JWR; no instruments  
643.12 m - begin 104m of 1/4" JWR; 6 clamp-on instruments  
747.37 m - 170 lb baffle (2' wide) with 8m of 1/2" LL chain  
755.61 m - 75 KHz RDI LongRanger ADCP in cage w/external battery case;  
includes T & P sensors;  
758.27 m - begin 10m of 1/4" JWR  
778.51 m - 5 lengths of 2m 3/8" chain, each with 2 glass balls in hard hats  
789.73 m - begin 500m of 1/4" JWR; 3 clamp-on instruments  
1289.98 m - begin 500m of 1/4" JWR; 1 clamp-on instrument  
1790.22 m - 4 lengths of 2m 3/8" chain, each with 2 glass balls in hard hats  
1799.20 m - begin 500m of 1/4" JWR; 1 clamp-on instrument  
2299.45 m - begin 500m of 1/4" JWR  
2799.69 m - 3 lengths of 2m 3/8" chain, each with 2 glass balls in hard hats  
2806.42 m - begin 104m of 1/4" JWR; 4 clamp-on instruments  
2910.67 m - begin 500m of 1/4" JWR; 1 clamp-on instrument  
3410.91 m - 3 lengths of 2m 3/8" chain, each with 2 glass balls in hard hats  
3417.65 m - begin 104m of 1/4" JWR; 5 clamp-on instruments  
3521.89 m - begin 500m of 1/4" JWR; 1 clamp-on instrumen  
4022.35 m - 2m of 3/8" SL chain  
4024.60 m - two 1m pieces of 3/8" SL chain - one for each release - in parallel  
4025.64 m - two Benthos releases in parallel