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CRUISE REPORT

VESSEL: *Oscar Elton Sette*, Cruise 04-03,(OES-12)

CRUISE PERIOD: 2-16 March 2004

AREA OF OPERATION: American Samoan waters (Fig. 1) within the U.S. Exclusive Economic Zone.

TYPE OF OPERATION: Latitudinal transects of conductivity-temperature-depth (CTD) casts to 1000 m deep were conducted along two track lines at longitudes 169°00'W (Track #2) and 170°30'W (Track #1). In addition, we completed one transect across the flanks and summit of the undersea volcano Vailulu'u (lat. 14°12.9'S, long. 169°03.5'W). This transect consisted of 12 CTD casts to 500 m deep.

ITINERARY:

2 March Embarked Daniel Curran, Reka Domokos, Kyle Hogrefe, and Craig Musburger. Departed the American Samoan port of Pago Pago Harbor at 1015 and proceeded due south to establish contact with Donald Hawn (who was aboard a commercial fishing vessel approximately 60 miles south of Pago Pago). Established radio contact with Don and proceeded south to the vicinity of the commercial vessel he was aboard. Tested the trawl gear, but winch power control failed and trawl operations were never successfully performed for the entirety of the cruise. Test run of CTD was successful.

3 March Embarked Donald Hawn from the commercial fishing vessel at 0630. Performed first CTD station at 16°00'S latitude and 170°30'W longitude at approximately 1100. Continued on northward track performing 1000 m CTD casts every 4 hours at every quarter of a degree in latitude along 170°30'W longitude track line. Chief engineer informed me that trawl winches were inoperable until a new relay

control box could be ordered, sent to Pago Pago, and installed on the vessel.

4-6 March Continued daily schedule of CTD casts every 4 hours along 170°30'W longitude track line until we completed 11°15'S CTD station. The captain decided to return to Pago Pago to obtain medical evaluation of Keith Golden (NOAA Corps) who had been suffering from a severe headache of unknown cause since March 2nd. Began transit south to Pago Pago to disembark officer Golden.

7 March Arrived Pago Pago Harbor 1000 and disembarked Officer Golden. Proceeded to undersea volcano of Vailulu'u and surveyed across the entire seamount to determine exact location of summit and desired transect angle across seamount. At 2100 performed first 500-m CTD cast 16 miles from summit at a bearing of 60° Northeast of summit (Table 1). Continued on a Southwestern transect (bearing 240°).

8 March Ran continuous CTD operations and finished conducting a total of 12 500-m CTD casts across Vailulu'u. Proceeded to Track #2 at longitude 169°00'W and resumed 1000-m CTD casts at latitude 14°15'S. Changed scheduled CTD casts to every 3 hrs to compensate for time lost transiting officer Golden to Pago Pago.

9-10 March Completed 11 CTD casts and southern portion of Track #2 at 16°45'S and began transit north to 14°00'S latitude along Track #2.

13 March Completed 4 CTD casts from 10°15'S to 11°00'S along Track #1 and began transit to Pago Pago to retrieve replacement relay control box for trawl system and to reembark Officer Golden.

11-12 March Completed 16 CTD casts along Track #2 and after finishing 10°15'S station began transit back to Track #1 to complete track line north of 11°15'S.

14 March Officer Golden and replacement relay control box were obtained at 1200. Began trawl system test at 1400; system worked for approximately 30 minutes, then the power control failed again. Priority shifted from getting the system to function to simply getting the gear back on board. Gear was eventually retrieved and we proceeded south towards southernmost latitude of Track #1 with the intention of completing 3 more CTD casts south of 16°00'S latitude.

15 March Arrived at southernmost station (lat. 16°45'S, long. 170°30'W) at 0600, but the CTD winch malfunctioned

and began to wire up. The emergency stop button on the winch control succeeded in preventing the CTD from hitting the block, but the last 3 CTD casts were cancelled to allow the engineers and survey technician a chance to figure out what went wrong with the winch. Cleaned wet lab and stored all gear in aft trawl control house.

16 March Arrived Pago Pago Harbor, America Samoa at 0900. Disembarked Daniel Curran, Reka Domokos, and Donald Hawn. Kyle Hogrefe and Craig Musburger remained on board for next cruise (OES 04-04). End of Cruise.

MISSIONS AND RESULTS:

A. Conduct two 1.5 hr stepped oblique trawl tows nightly to collect biological specimens (micronekton)in an effort to describe the biological oceanography in waters north and south of American Samoa that are actively fished by commercial longline vessels exploiting albacore tuna resources. Simultaneous to trawl operations, monitor the sonic scattering layer(SSL) with the Simrad EK-60 echosounder to characterize the micronekton faunal composition and densities as the forage base for larger pelagic nekton.

This mission was a failure due to equipment malfunction. Two tests of the boat's trawl system were performed. During both tests the power control system to the trawl winches failed and no trawls were conducted in the manner desired for the duration of the cruise. During both tests, the cod end was deployed in a ready mode, and the first test resulted in the collection of a single sample collected over a period of approximately 2 hrs of towing from about 150 m in depth to surface depths without any measure of discrete fishing depths. The unsorted sample from this failed test was stored in a 10% formalin sea water solution and secured on the vessel until the vessel returned to Honolulu on 9 April 2004. The second unsuccessful test of the trawl system was conducted during daylight hours, and the cod end was empty upon retrieval. During both test tows, the boat speed varied from 3.5 knots to 1.5 knots.

Simrad EK-60 Echosounder data were collected during all transects between CTD stations. This information was not analyzed during the cruise and analysis (without corresponding trawl samples)is pending.

B. Evaluate trawl net performance via a Northstar Electronics Netmind mensuration system.

This system, which consists of: depth, temperature, vertical opening, and wingspan opening sensors for the dual warp Cobb (Stauffer) trawl failed to communicate during the first trawl

system test. The electronics technician on board the *Sette* corrected improper wiring by a previous electronics technician, and the system worked well during the second trawl system test. Depth/temperature readings from the Netmind system were validated with Lotek temperature depth recorders that were deployed adjacent to the Netmind sensors.

C. Describe the physical environment via routine CTD casts and continuous Acoustic Doppler Current Profile (ADCP) and Thermosalinograph (TSG) measurements.

Conducted a total of 63 CTD casts (Table 1) which consisted of 51 (1000 m) CTD casts along two north to south track lines at longitudes 169°W and 170°30'W, and 12 (500 m) CTD casts across Vailulu'u seamount (lat. 14°12.9'S, long. 169°03.5'W). The ADCP was inoperable for the duration of the cruise and no ADCP information was obtained. Continuous measurements of surface temperature and salinity via the TSG were successfully obtained.

D. Assess the influence of the physical dynamics on biological productivity in the region through CTD-mounted fluorometer measurements, dissolved oxygen sensors, TSG measurements, discrete depth nutrients, and extracted chlorophyll and accessory pigment determinations.

Depth profiles for temperature, salinity, dissolved oxygen, and fluorometry were recorded for each CTD cast. Discrete depth nutrient samples were collected on 50 CTD casts. The collection of both 2- and 1-liter discrete depth water samples combined with additional CTD stations (in lieu of trawl operations) exhausted our supply of filters, thus limiting the number of discrete depth samples obtained to 50 CTD cast locations. Filtered discrete depth samples were stored on the vessel and will be analyzed at a later date. A summary table with notes for each CTD cast is attached (Table 2).

E. Miscellaneous oceanographic observations.

During all transect runs between CTD stations, sea surface temperature (SST) varied less than 1 degree of Centigrade. The lowest recorded SST (29.2°C)was at the southernmost station (16°45'S) and the highest temperature (30°C) was at one of the northernmost stations (10°15'S).

DATA COLLECTED:

The following forms, logs, charts, and data records were kept and given to the Pacific Islands Fisheries Science Center upon termination of the cruise. These include all data captured onto computer storage media during the cruise. All the records are filed there unless indicated otherwise in parentheses.

CTD Station Data Log Sheet
Seabird CTD data files on CD-ROM*
Digital camera photos (JPG file format) on CD-ROM*
Marine Operations Log
Deck Log
Scientist's Log
SCS data files (raw & compressed) on CD-ROM*
XBT (SEAS) data files on CD-ROM*

*All data files together on the same (1) CD-ROM

SCIENTIFIC PERSONNEL:

Daniel Curran, Chief Scientist, Joint Institute for Marine and Atmospheric Research (JIMAR), University of Hawaii (UH).
Reka Domokos, Cooperating Scientist, JIMAR, UH.
Donald Hawn, Cooperating Scientist, JIMAR, UH.
Kyle Hogrefe,Cooperating Scientist, JIMAR, UH.
Craig Musburger, Cooperating Scientist, JIMAR, UH.

Submitted by: (/s/Daniel S. Curran)
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Daniel S. Curran
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Jeffrey P. Polovina
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Attachment

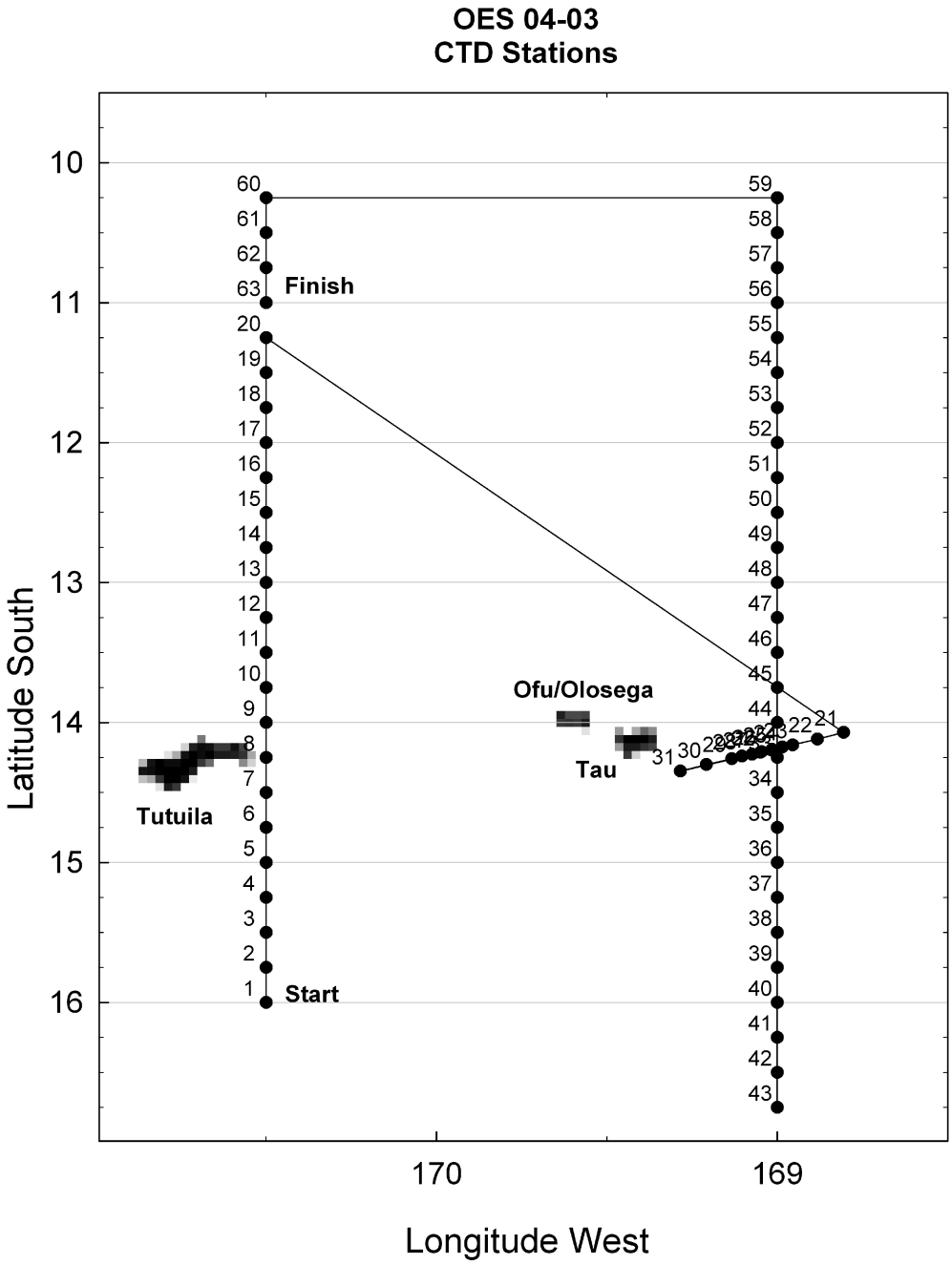

Figure 1- OES 04-03 Track line of Seabird CTD Stations.