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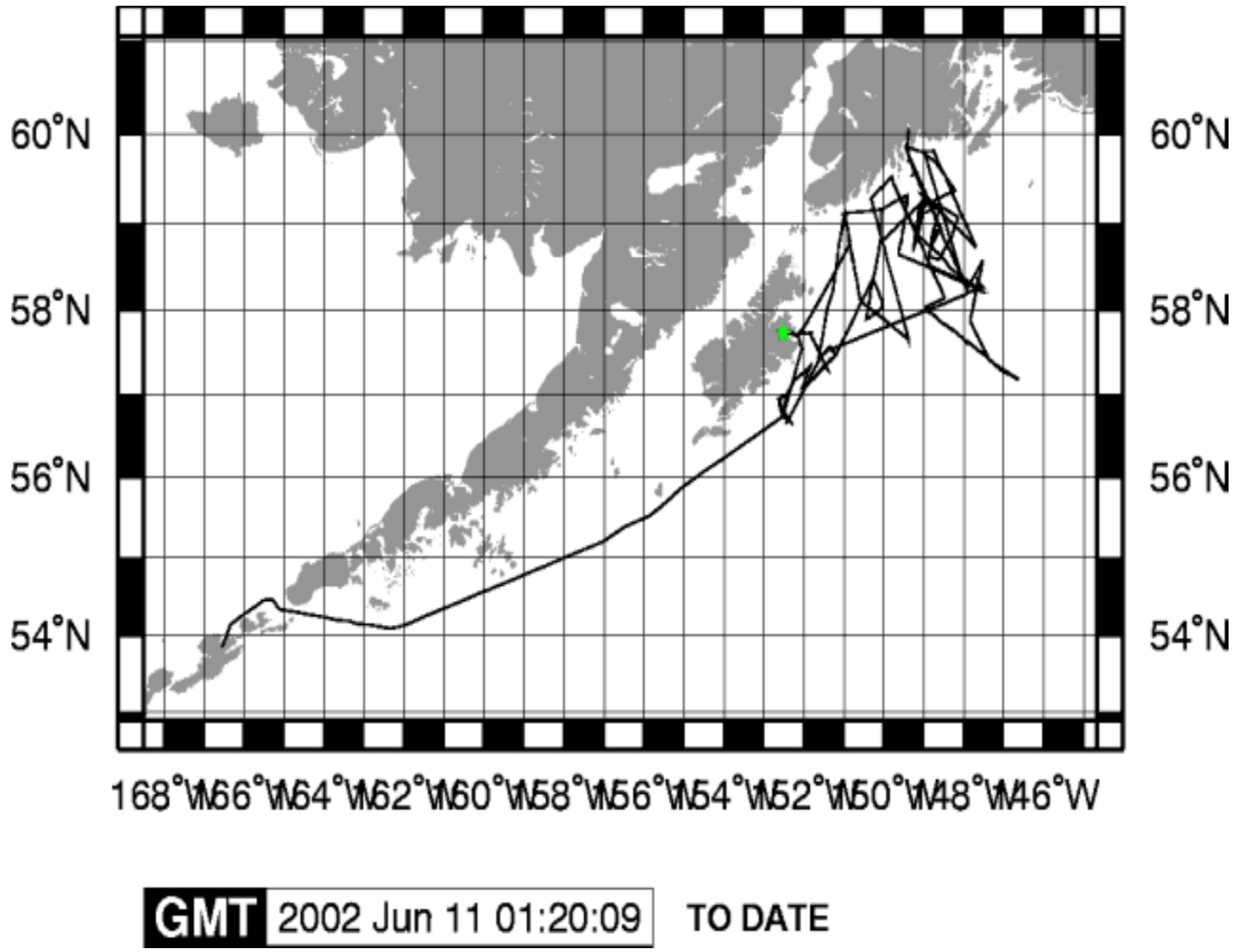
R/V Maurice Ewing Data Reduction Summary

EW–0205 Dutch Harbor – Kodiak

Date	Julian Date	Time	Port
May 12, 2002	132	12:00:00	Dutch Harbor, AL
June 10, 2002	162	09:06:00	Kodiak, AL



Project Summary

DESCRIPTION

Background and Scientific Objectives

Fisheries−Oceanography coordinated Investigations (FOCI) is an effort by National Oceanic and Atmospheric Administration (NOAA) and associated academic scientists. FOCI's goal is to understand the effects of abiotic and biotic variability on ecosystems of the North Pacific Ocean and Bering Sea in order to discern the physical and biological processes that determine recruitment variability of commercially valuable finfish and shellfish stocks in Alaskan waters. This cruise is in support of the United States Global Ocean Ecosystems Dynamics (U.S. GLOBEC) and the Steller Sea Lion Research Programs. This cruise is being undertaken by FOCI in support of research into the physical, chemical, and biological mechanisms acting in the coastal Gulf of Alaska.

The first leg will involve the recovery of 16 moorings, the deployment of 25 moorings, which includes two 2.3−meter diameter surface fiberglass−over−foam toroid moorings, in addition to Conductivity, Temperature, and Depth (CTD) profile operations at each mooring site and at night.

The second leg will involve nearly continuous operations at CTD/Bongo stations, with some CalVET tows at selected sites, plus four MOCNESS tows. If time and conditions permit an eddy experiment involving ARGOS satellite tracked drifters and CTD/Bong stations will be conducted. Approximately 16 satellite−tracked drifters will be deployed during the course of the two legs of the cruise.

Cruise Members

Science Party

William Floering	Chief Scientist (Leg 1)	William.Floering@noaa.gov
Nancy Kachel	Chief Scientist (Leg 2)	Nancy.Kachel@noaa.gov
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Ship's Science

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Ship Crew

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All data in this report is logged using GMT time and Julian days in order to avoid confusion with local time changes.

Hydrosweep

Hydrosweep data acquistion was good with an average of less than 1.5% dropped beams. We did experience another incident of "multiple tracking" in shallow water ; however, this was due to an incorrect receiver minimum depth setting that explicitly prevented the system from looking below 65 meters for bottom depth. The error was noted during the CTD/Bongo station #19 and corrected on ~0500 GMT on julian day148.

Weather

For three days beginning on julian day 148, the humidity remained pinned at 99%. In an effort to determine if there was indeed a problem with the sensor, Ted and I tested and replaced the humidity transducer with a spare around 0222 GMT on julian day 151. The corresponding sub 55% readings are to be disregarded.

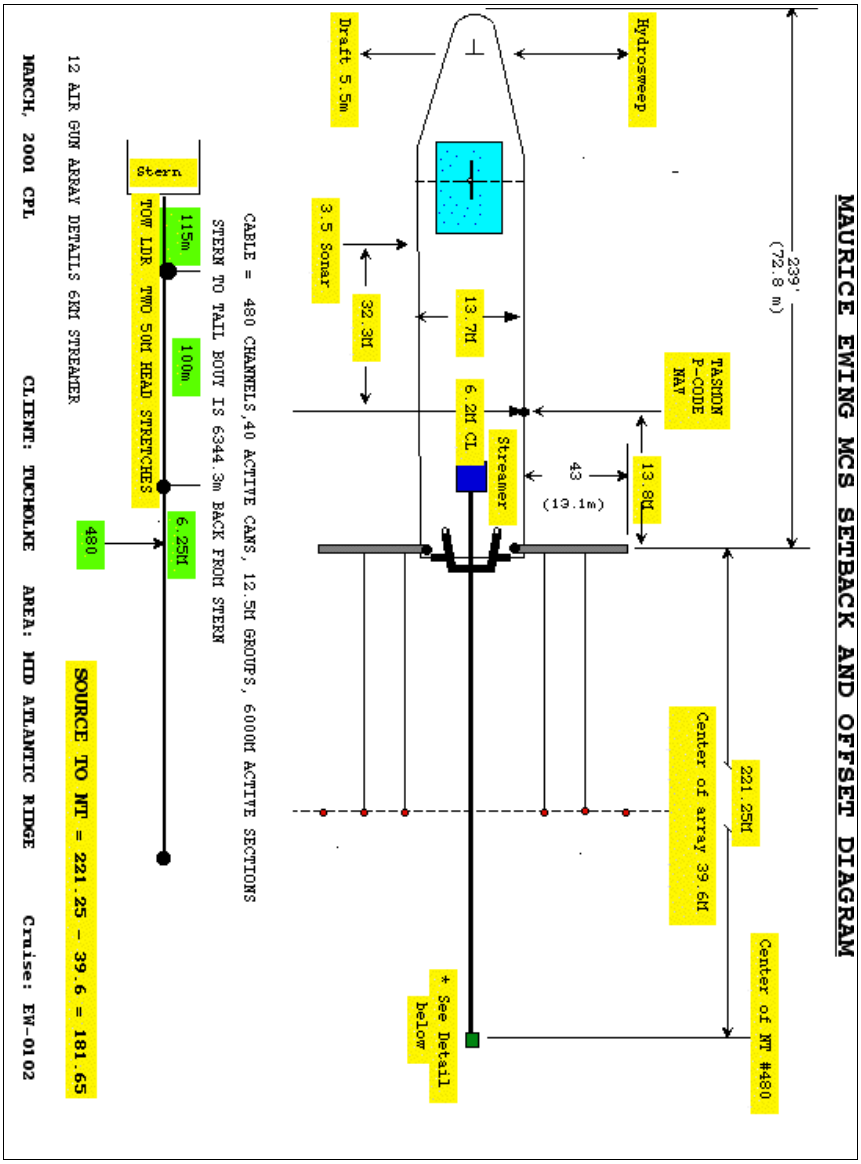
Thermosalinograph

At ~ 1900 GMT on julian day 133, the TSG was turned off for plumbing purposes. The work was completed before day's end.

Over the course of the cruise, there were a few incidences (first noted by Calvin at ~2126 GMT on julian day 137) where an unusually high amount of air bubbles were passed through to the TSG. This created a significant amount of "jitter" in the data. As these problems were identified, Chris immediately tweaked the incoming water flow pumps. Data collected over julian days 137 and 148 were particularly bad.

In an effort to troubleshoot a problem with the Bongo laptop's serial port, the TSG serial line was inadvertently disconnected. As a result, no TSG data was acquired on julian day 147.

Ship Offset Diagram



Data Logging

The R/V Maurice Ewing data logging system is run on a Sparc Ultra Enterprise Server. Attached are 48 serial ports via 3 16−port Digi International SCSI Terminal Servers. Generally, all data logged by the Ewing Data Acquisition System (DAS) is time stamped with the CPU time of the server, and broadcast to the Ewing network using UDP packet broadcasts. The CPU time of the server is synchronized once every half hour to a Datum UTC gps time clock.

GPS times are also time−tagged with cpu time, although the time of the GPS position is from the GPS fix itself.

The following tables describe the data instruments which performed logging during this cruise. The tables associated with the instruments describe logging periods and data losses for that instrument.

Time Reference

Datum StarTime 9390−1000

logging interval: 30 minutes
file id: tr2

Used as the CPU synchronization clock. This clock is polled once every half hour to synchronize the CPU clock of the data logger to UTC time. The logger (octopus) is responsible for updating the times of the other CPUs.

This clock was running and synchronizing the system the entire cruise.

Interruption s greater than 30 minutes are displayed in the following table

Log Date	LogDate	Comment
2002+132:00:04:29.731		Logging officially started
2002+161:18:04:29.758		Logging officially ends

GPS Receivers

GPS data is usually logged at 10 second intervals. The NMEA strings GPGGA and GPVTG are logged for position, speed, and heading fixes. This data was logged constantly throughout the cruise.

The Tasmon GPS was the primary GPS for this cruise.

Trimble Tasmon P/Y Code Receiver

logging interval: 10 seconds
file id: gp1

The Tasmon is the primary GPS receiver for the Ewing Logging system and the primary GPS for Spectra fixes. The accuracy is around 15 meters. There were no interruptions during this cruise.

Interruptions greater than 10 minutes are displayed in the following table

Log Date	LogDate	Comment
2002+132:20:34:51.117		Logging officially started
2002+161:18:00:32.864		Logging officially ends

Trimble NT200D

logging interval: 10 seconds
file id: gp2

The Trimble is the secondary receiver for GPS data. Data is logged at 10 second intervals and is also used as an input to Spectra, although it is weighed at a lower value than the Tasmon receiver.

Interruptions greater than 10 minutes are displayed in the following table

Log Date	LogDate	Comment
2002+132:20:35:17.718		Logging officially started
2002+145:05:49:03.983	2002+145:06:06:55.448	Data Interruption
2002+145:06:22:14.014	2002+145:06:35:01.426	Data Interruption
2002+145:08:28:08.185	2002+145:09:57:19.889	Data Interruption
2002+146:21:04:20.287	2002+146:21:38:49.667	Data Interruption
2002+161:18:00:34.230		Logging Ends

Speed and Heading

Furuno CI−30 Dual Axis Speed Log
Sperry MK−27 Gyro

logging interval: 6 seconds
file id: fu

The Furuno and Gyro are combined to output speed, heading and course information to a raw Furuno file, as well as an NMEA VDVHW signal used as an input to various systems including steering and Spectra.

Interruptions greater than 30 minutes are displayed in the following table

Log Date	Log Date	Comment
2002+132:20:37:19.086		Official start date
2002+161:18:00:33.144		Official end date

Bathymetry

Krupp Atlas Hydrosweep−DS2

logging interval: variable based on water depth
file id: hb (centerbeam), hs (swath)

The hydrosweep full swath data is continuously logged for every cruise, and centerbeam data is extracted and processed separately. The centerbeam operates at a logging frequency dependent on the water depth.

The full swath data is not routinely processed, but can be processed with the MB−System software which can be downloaded for free. For instructions, use the website: http://www.ldeo.columbia.edu/MB−System.

MBSystem, version 5.0beta3 is necessary to process data after June 1, 2001.

Interruptions greater than 10 minutes are displayed in the following table

Log Date	LogDate	Comment
2002+132:20:43:47		Official start logging
2002+161:18:00:22		Official end logging

Weather Station

RM Young Precision Meteorological Instruments, 26700 series

logging interval: 1 minute
file id: wx

The weather station is used to log wind speed, direction, air temperature, and barometric pressure. We log this information at 1−minute intervals.

Log Date	LogDate	Comment
2002+132:20:41:43.668		Official start logging
2002+151:01:59:00.599	2002+151:01:59:00.599	Data Interruption
2002+161:18:00:00.182		Official end logging

For all formats, a – in the time field means an invalid value for some reason.

Raw Furuno Log — fu.s

```
This data has been smoothed and output 1 fix per minute.
CPU Time Stamp          Track Speed Hdg   Gyro
2000+166:00:01:53.091 –     4.4   140.5 148.3
```

Hydrosweep Centerbeam — hb.n

```
Hydrosweep data merged with navigation
                                Centerbeam
CPU Time Stamp        Latitude Longitude          Depth
2000+074:09:55:00.000  N 13 6.6206    W 59 39.3908   134.9
```

Merged Data — m

```
                                                        GPS
CPU Time Stamp          Latitude     Longitude          Used  Set  Drift Depth
2000+200:12:25:00.000  N 45 54.1583 W 42 47.1770      gp1   0.0  0.0

Magnetic                        Gravity
Total Intensity   Anomaly     FAA  GRV        EOTVOS   Drift   Shift
49464.7           55.5        22.2 980735.0   –8.4     –0.1     2.8

Temperature Salinity Conductivity
0.0         0.0      0.0
```

The gravity drift and shift are values that have been added to the raw gravity to make up for drift in the meter that has been lost in accordance with a gravity check at each port stop.

Temperature,Salinity and Conductivity will only be valid while logging a Thermosalinograph, which is not usually the case.

Navigation File — n

```
CPU Time Stamp          Latitude     Longitude        Used  Set  Drift
2000+074:00:03:00.000 N 13 6.2214  W  59 37.9399    gp1   0.0   0.0
```

Datum Time — ts2.r

```
CPU Time                Datum Time        Time Reference
2001+069:00:15:29.727 069 00 15 29.378 datum
```

Raw GPS — gp(12).d

Raw GPS is in NMEA Format.

Meteorological Data wx

```
                          True
CPU Time Stamp          Spd Dir

2001+045:00:00:00.967   7.8  22

Bird1:                                          Bird 2
Speed                   Direction               Speed                   Direction
Inst  60sA   60mA  60sM  Inst 60sA 60mA        Inst  60sA  60mA  60sM   Inst 60sA 60mA

7.8   6.6    8.5   16.8  277  291  5           0.0   0.0   0.0   0.0    0    0    0

Temperature                     Humidity
Inst  60mA  60mm  60mM         Inst 60mm 60mM          Barometer

15.0  14.2  14.3  15.1         92   90   93            1027.5

Inst:       Current
60sA:       60 second average
60mA:       60 minute average
60sM:       60 second maximum
60mm:       60 minute minimum
60mM:       60 minute maximum
```

Merged Meteorological Data mmet.n

```
TSG, WX, CT merged with Nav at 1 minute fixes
date        time        lat       lon       gpu head spd
2001+244:00:00:00.000 12.14071 44.98469 gp1 10.2 83.0

tws  twd   temp hum  press  cti  cte  con sal  ct
26.5 228.0 30.6 87.0 1000.8 28.8 28.8 5.9 36.3 28.8

gpu  = gps unit in use
head = ship's heading
spd  = ship's speed in knots
tws  = true wind speed
twd  = true wind direction
temp = air temp (celcius)
hum  = relative humidity (%)
press= pressure in mb
cti  = sea temp from the internal TSG sensor
cte  = sea temp from the external TSG sensor
con  = conductivity, Siemens/meter
sal  = salinity, practical salinity units
ct   = sea temp from the C-keel sensor (to tenths of a degree)
```

Merged Thermosalinograph Data sg.n

```
TSG merged with navigation at 10 and 6 second fixes. (See Cruise Notes)
```

```
date      ime             Lat       Lon        Seabird hex data       lipts68  eipts68
2001+244:23:59:31.892  12.14071 44.98469  A907E23A2853F0713BD8  28.301   28.283

lcond   lsal
5.850   36.370
```

lipts68 = local water temp sensor, degrees C
eipts68 = external water temp sensor, degrees C
lcond   = conductivity local
lsal   = local salinity calculated from lcond and lipts68

IPTS68 indicates the model whose calibration constants are lodged in the l_tsg2.c logging process’s source code.

Tape Contents

EW0205

EW0205pdf	this document
ew0205.cdf	NetCDF database file of this cruise
ew0205.cdf_nav	NetCDF database file of this cruise' navigation
adcp/	ADCP data
configs/	Ewing logging, reduction, and watchdata configuration files
docs/	File Formats
plots/	Waypoint plots with gridded Sandwell bathymetry
processed/	Processed datafiles merged with navigation
trackplots/	daily cruise track plots (*postscript*)
raw/	Raw data directly from logger
reduction/	Reduced data files
clean/	daily processing directory, includes daily postscript plots of the data.