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U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
National Ocean Service  
Center for Coastal Fisheries and Habitat Research  
101 Pivers Island Road  
Beaufort, North Carolina 28516

***Comparative analysis of the functioning of disturbed and undisturbed  
coral reef and seagrass ecosystems in the Tortugas:  
Phase I- Establishing a baseline***

August 6, 2001

Progress Report #6 for  
NOAA Ship Ferrel Cruises FE-01-10-BL and FE-01-10-BL

17 June 2001 - 01 July 2001  
08 July 2001 - 21 July 2001

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Submitted By:

\_\_\_\_\_  
Mark S. Fonseca  
Project Coordinator, CCFHR  
August 6, 2001

Approved By:

\_\_\_\_\_  
Donald E. Hoss, Director  
CCFHR  
August 6, 2001

\_\_\_\_\_  
Gary C. Matlock, Director  
NCCOS  
August 6, 2001

## INTRODUCTION

In July 2001, the Tortugas Ecological Reserve was established. It includes two components: Tortugas North and Tortugas South (Figure 1). Tortugas North is approximately 151 nm<sup>2</sup> and covers the northern half of Tortugas Bank, Sherwood Forest, the pinnacle reefs north of the bank, and extensive low relief areas in the 15-40 m depth range. The latter low relief areas have received little assessment. Tortugas South is approximately 60 nm<sup>2</sup> and encompass Riley's Hump as well as deep water habitats to the south which are reported to provide critical habitat for several snapper species, snowy grouper, tilefish, and golden crab. The implementation of this reserve provides an excellent opportunity for NOAA

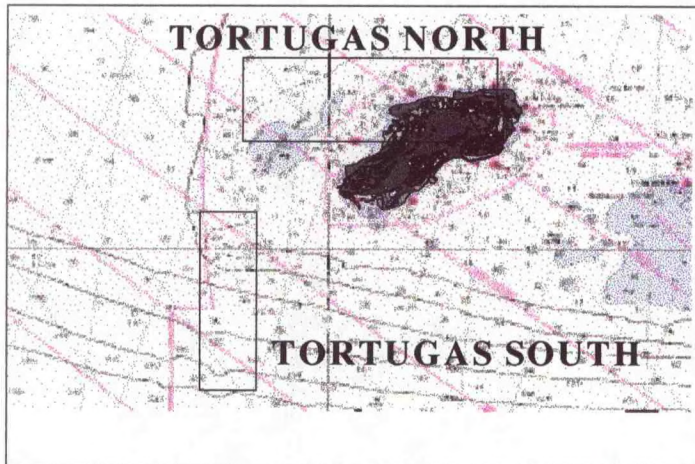


Figure 1. Boundaries of the Tortugas Ecological Reserve.

to investigate the effects of human disturbance (e.g., elimination of consumptive sampling and physical impacts) on the functioning of coral reef and deepwater algal and seagrass ecosystems. Specifically, to determine the efficacy of this management action, several long-term monitoring actions must be taken, including evaluating the local and regional areas in terms of larval fish export, changes in adult fish biomass, and especially, changes in ecosystem structure and associated ecological processes.

The National Centers for Coastal Ocean Science, here headed by the Center for Coastal Fisheries and Habitat Research (CCFHR) and our colleagues both in and out of NCCOS (Center for Coastal Monitoring and

Assessment, Coastal Services Center, Florida Marine Research Institute, National Undersea Research Center, and the University of South Florida) are uniquely poised to provide critical mission support to habitat characterization and marine reserve questions that are facing the Tortugas Ecological Reserve (TER) within the Florida Keys National Marine Sanctuary (FKNMS). CCFHR has researched fishery-habitat interactions in south Florida and the Keys since the early 1980's and brings a wide range of scientific expertise to bear on fisheries and habitat issues. Moreover, we are coordinating this work with the research approach and philosophy of applied studies of our other studies in the region - including injury recovery experiments, monitoring and modeling in the FKNMS, linkages among coral reefs and adjacent habitats in Puerto Rico, EFH funding on the contribution of deepwater primary producers to coastal fisheries, gear impact studies, and long-term studies of ichthyoplankton distribution, development and transport mechanisms.

The need for detailed habitat characterization is inextricably linked with the reserve issue. Many reef fishes leave the structure of the reef at night to forage in the adjacent sand, algal and seagrass flats, thereby importing significant amounts of nutrients onto the reef environment, contributing to its high productivity. This mass transfer also ultimately contributes to energy requirements of small grazers that cannot themselves access the adjacent, non-coral reef resources. The adjacent seagrass beds are also significant settlement areas for post-larval reef fishes. Over-fishing of the diurnally migrating fishes and/or physical damage to the foraging/settlement environment could significantly alter the reserve's productivity and biological diversity. Therefore, habitat characterization is critical to determine the distribution of sessile resources that are susceptible to injury and which may be poised to rebound once any injury activity is relaxed through implementation of the reserve. Habitat characterization is also crucial to ultimately determine an ecologically optimal size of the reserve complex (i.e., the reef and the

adjacent areas upon which reef fauna are dependent) to yield optimum fishery production and maintain the ecological health of the reef ecosystem. Finally, conducting work in the TER provides a unique opportunity to compare the structure and function of a relatively undisturbed system with those elsewhere in the FKNMS and adjacent waters. This comparative approach has significant potential for translating the findings of these studies so as to apply them directly to management issues in other NOAA trust resources.

In support of this research, the NOAA Ship Ferrel arrived in Key West, FL on 16 June 2001 to support research objectives of the CCFHR and collaborators (CCMA, CSC, FMRI, NURC, USF) in the Dry Tortugas Ecological Reserve. This marked the first three legs of a four week excursion for the Ferrel. A total of twenty-seven scientists representing five federal and state institutions participated.

## OBJECTIVES

**Programmatic:** Over the three year period of this work, we have proposed:

- 1) a preliminary characterization and inventory of the benthic habitat and fish communities in the extreme depths of the Tortugas South reserve component;
- 2) characterization of spawning aggregations and initiating the development of a probabilistic model of the fate of snapper larvae, focusing on Riley's Hump;
- 3) beginning comparative characterization of shallow and deepwater seagrass communities and their contribution to fishery resources in disturbed (outside the reserve) and undisturbed sites (inside the reserve);
- 4) establishment of a baseline for benthic nutrient composition and flux in disturbed and undisturbed sites;
- 5) determination of the accuracy of existing habitat delineations within the proposed ecological reserve as a function of depth and disturbed and undisturbed sites;
- 6) examination of how high resolution ecological data of a given habitat type can be scaled to the larger spatial context of the proposed ecological reserve.

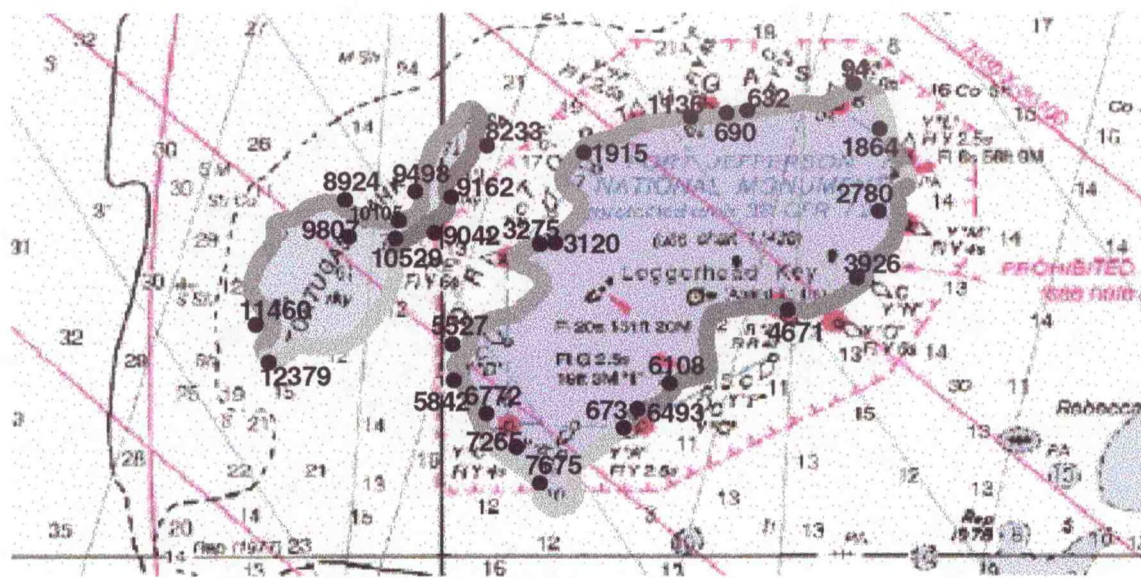
**Cruise FE-01-10-BL and FE-01-11-BL:** Here, our objectives were to:

- 1) Conduct seafloor surveys at selected permanent stations (Figure 2) within Tortugas North, centered around the National Park and the northern boundary of the proposed reserve.
- 2) Establish permanent transects at each station along the reef/plain interface.
- 3) Collect comparative data of resident invertebrate, fish and plant populations as part of ongoing Essential Fish Habitat (EFH) research as part of the Florida Keys National Marine Sanctuary (FKNMS) effort to assess the efficacy of the institution of an Ecological Reserve at the Dry Tortugas.
- 4) Characterize spawning aggregations and initiate the development of a probabilistic model of the fate of snapper larvae.

**Cruise Component:** 17 June 2001  
22 June 2001

Departed Key West, FL  
Arrived Key West, FL

-video and sonar mapping along defined transects up to ~3 km length using Quester Tangent seafloor classification system and towed MiniBat; at select stations, deployed divers to establish permanent transects, conduct video mapping, perform fish counts, collect sediment cores and penetration measurements, and collect fish and coral samples for stable isotope analysis; collected incident radiation and measures of water clarity; performed nightly beam trawls; performed crepuscular fish counts at selected stations; deployed small buoys with benthic baits to assess herbivore behavior



- Permanent Stations
- Strata
- Out N
- Out S
- Park N
- Park S
- Reserve N
- Reserve S

Figure 2. Tortugas North with survey strata and permanent stations.

**Participants:**

Name	Title	Affiliation
Penny Hall	Chief Scientist	FMRI, St. Petersburg, FL
Amy Uhrin	Field Party Chief	NOS, Beaufort, NC
Donald Field	Geographer	NOS, Beaufort, NC
Craig Bonn	Biological Technician	NOS, Beaufort, NC
John Burke	Fishery Biologist	NOS, Beaufort, NC
Kevin Madley	Biologist	FMRI, St. Petersburg, FL
Ken Brennan	Biologist	NOS, Beaufort, NC
Mark Monaco	Biologist	NOS, Silver Spring

**Cruise Component:** 25 June 2001      Departed Key West, FL  
 01 July 2001      Arrived Key West, FL

—continued video and sonar mapping along defined transects up to ~3 km length using Quester Tangent



## DRY TORTUGAS ECOLOGICAL RESERVE (NORTH)

**Station Location and General Survey Work:** Extensive benthic mapping (video transects) within Tortugas North, focusing on the stations surrounding the National Park, was conducted using a MiniBat TOV housing a camera and Quester Tangent seafloor classification system sonar system. We will transfer the video-based record of benthic cover at 1 m resolution into a Geographic Information System (GIS: ArcView). Beam trawls and PONAR grabs samples were taken at selected stations along the aforementioned video transects. Divers were deployed to establish permanent transects conduct video and fish surveys, collect stable isotope samples, and extract sediment cores in conjunction with MiniBat towing. Incident radiation and measures of water clarity were taken when appropriate.

**Approach (Specific):** We continued with the sampling protocol that had been adopted beginning with the February cruise aboard the OREGON II (OT-01-01). To reiterate, based upon previous extensive habitat characterizations, six categories of habitat had been established: Out North (outside the reserve/park, north of the prevailing current) Out South (outside the reserve/park, south of the prevailing current), Park North (inside the park, north of the prevailing current), Park South (within the park, south of the prevailing current), Reserve North (within the reserve, north of the prevailing current), and Reserve South (within the reserve, south of the prevailing current; Figure 2). Five random sample points were selected from within each of the six categories (Figure 2). These 30 stations had been previously mapped during the February and April (FE-01-07-BL) cruises using a MiniBat® TOV housing a vertically-mounted camera and Quester Tangent seafloor classification system® sonar system. Additional small scale mapping was conducted at five of the sites by making 0.25 nm "S" turns with the MiniBat® at the break between sand and coral, running parallel to the depth contour. For this cruise, we continued with the small scale mapping at the remaining 25 stations. The location of the reef/plain interface was determined using the ship's fathometer. Two or three passes were made over the original station coordinates. When the break point was determined, a mark was taken. Due to depth constraints for divers, four of the original stations had to be replaced with stations that had reasonable depths for diving. These replacements were chosen randomly. A list of the 30 permanent stations is given in Appendix I (see also Figure 2).

**Diving:** Divers were deployed to establish permanent transects along the reef/plain interface using the specified mark. When the interface was not located at the specified mark, divers searched the area until the interface was located. Upon surfacing, a new mark was taken with a Trimble GPS unit. All permanent transects were completed, whether newly established or relocated. Video mapping, fish counts, fish and coral collections, and sediment extractions and penetration measurements were made at each station. In addition, several crepuscular observations of fish movement were made at selected stations. A complete listing of all dive statistics is presented in Appendix II.

**Beam Trawl:** At select stations, we conducted 3-5 minute tows. Samples were initially preserved in formalin (24h) and then transferred to ethyl alcohol.

**PONAR Grabs:** At select stations, we conducted PONAR grab sampling. Sediment samples were removed from the grab sample for analysis of sediment particle size and benthic chlorophyll content.

**Ancillary Data:** We collected incident radiation and measures of water clarity at select stations along the aforementioned video transects. We recorded the GIS tracks of all tows, as well as drop camera, beam trawls, incident radiation, and water clarity stations. A complete listing of all data/samples collected is given in Appendix III.

## DRY TORTUGAS ECOLOGICAL RESERVE (SOUTH)

**Station Location and General Survey Work:** The main objective of Leg 2 was to continue work on the

objective of characterization of spawning aggregations and initiating the development of a probabilistic model of the fate of snapper larvae, focusing on Riley's Hump. Drifter releases and dive operations were centered at Riley's Hump. Ichthyoplankton sampling radiated out from there.

**Approach (Specific):** .

Drifter release: WOCE/SVP drifters were released three times during the cruise (Appendix IV). Four drifters were released at the beginning of Leg 2, and 3 drifters were released at the end of the Leg. These drifters are being used to predict the fate of larvae spawned over Riley's Hump. This information is central to understanding the potential role of Riley's Hump as a source area for settlement stage fishes to other reef habitats.

Ichthyoplankton sampling: Ichthyoplankton sampling was conducted using a 60-cm bongo with 333  $\mu\text{m}$  mesh nets. Oblique tows were made from the surface to a maximum of 100 m at each station (Appendix IV). CTD casts were also made at each station to collect temperature and salinity data. Stations radiated out from Riley's Hump. Drifter tracks indicate very different flow dynamics to the north and south of Riley's Hump and the larval fish collections will allow determination of the species of fish influenced by the different flow dynamics.

Diving: Visual census transects were completed in a randomized design to develop baseline data as to the number of snappers and groupers resident on Riley's Hump. In all ten sites were censused with an average of four transect each. These baseline data will serve as a reference for future monitoring, which will determine whether snapper and grouper abundance increase in conjunction with the reserve status. Dive statistics are given in Appendix II. Sample summaries are given in Appendix IV.

**APPENDIX I.** Thirty permanent stations for interface study.

<b>Station ID</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Depth (ft)</b>
RN1915	24.703150000	82.92815	100
RN9807	24.660900000	83.0467	63
RN10105	24.668816667	83.021566667	83
RN9498	24.683433333	83.013583333	75
RN8924	24.679250000	83.048716667	92
RS8233	24.706733333	82.977483333	104
RS9042	24.662300000	83.003666667	82
RS9162	24.680633333	82.9951	87
RS10262	24.662300000	83.003666667	91
RS10529	24.659585389	83.023301314	85
ON5842	24.589100000	82.993966667	85
ON94	24.737799622	82.793482367	97
ON5527	24.607116670	82.994816667	100
ON6772	24.572633330	82.97785	72
ON11460	24.616700000	83.093316667	79
OS1864	24.715007833	82.780515	61
OS6731	24.564866183	82.908384117	80
OS7265	24.555500000	82.9628	79
OS7675	24.537416660	82.951066667	79
OS12379	24.598416667	83.087083333	103
PN632	24.723883994	82.846429714	96
PN690	24.722817989	82.856984239	97
PN1136	24.721195739	82.874649469	99
PN3120	24.657728508	82.942727	87
PN3275	24.656763525	82.950820475	96
PS2780	24.673361295	82.780903483	54
PS3926	24.640229853	82.791548761	68
PS4671	24.623451044	82.825840933	79
PS6108	24.587854058	82.885310917	72
PS6493	24.574495475	82.901414336	78



**APPENDIX II. Dive Statistics**

<b>Diver Name</b>	<b>%O2</b>	<b>Depth</b>	<b>Bottom Time/Residual</b>
<b>June 18th, 2001</b>			
Craig Bonn	36	63	33
Ken Brennan	36	62	33
Mark Monaco	36	61	31
John Burke	36	61	30
Craig Bonn	36	83	23/40
Kevin Madley	36	82	23
John Burke	36	79	30/45
Mark Monaco	36	82	29/44
Amy Uhrin	21	82	29
Craig Bonn	36	61	35
John Burke	36	61	36
<b>June 19th, 2001</b>			
Craig Bonn	36	103	23
Don Field	36	102	23
John Burke	36	100	29
Mark Monaco	36	100	30
Erik Eilers	36	78	26
Ken Brennan	36	78	25
Craig Bonn	36	79	25/36
Mark Monaco	36	77	38/49
Amy Uhrin	36	78	38
James Bunn	36	72	15
Kevin Madley	36	72	15
<b>June 20th, 2001</b>			
Craig Bonn	36	91	27
Mark Monaco	36	89	27

John Burke	36	90	33
Amy Uhrin	36	89	33
Craig Bonn	36	80	28/45
Ken Brennan	36	80	28
Mark Monaco	36	80	30/39
John Burke	36	80	30/45
Craig Bonn	36	79	34/45
Kevin Madley	36	79	34
Amy Uhrin	36	79	34/39
Mark Monaco	36	78	29/40
Don Field	36	77	29
John Burke	36	79	30/41
Ken Brennan	36	79	30/41

**June 21st, 2001**

Craig Bonn	36	100	30
Amy Uhrin	36	98	30
John Burke	36	98	30
Mark Monaco	36	96	30
Craig Bonn	36	79	27/44
Erik Eilers	36	77	27
John Burke	36	76	37/54
Mark Monaco	36	77	37/54
Craig Bonn	36	72	30/41
Kevin Madley	21	72	30
Ken Brennan	21	69	28
Amy Uhrin	36	69	27
Mark Monaco	36	70	30/41
Don Field	21	71	30
James Bunn	21	71	14
John Burke	21	70	15

**June 22nd, 2001**

Craig Bonn	21	85	27
Amy Uhrin	21	85	28

**June 26th, 2001**

Craig Bonn	36	104	30
K. Hammerstrom	36	104	30
John Burke	36	103	30
Amy Uhrin	36	104	30

Craig Bonn	36	86	31/46
K. Hammerstrom	36	86	31/46

Mark Fonseca	36	85	35
Christine Addison	36	84	36

John Burke	36	85	25
Amy Uhrin	36	85	25

**June 27th, 2001**

Craig Bonn	36	85	35
K. Hammerstrom	36	85	35
John Burke	36	85	38
Amy Uhrin	36	85	38

Mark Fonseca	36	96	33
Christine Addison	36	95	33

Erik Eilers	36	87	30
Craig Bonn	36	87	30
John Burke	36	86	39
Amy Uhrin	36	86	40

Mark Fonseca	36	86	36/45
Christine Addison	36	85	38/47

**June 28th, 2001**

Craig Bonn	36	75	45
K. Hammerstrom	36	74	45
John Burke	36	70	52

Amy Uhrin	36	69	51
Craig Bonn	36	100	25/38
Donna Berns	36	99	25
Mark Fonseca	36	99	39
Christine Addison	36	98	39
K. Hammerstrom	36	97	28/36
Jeff Judas	36	98	28

**June 29th, 2001**

Craig Bonn	36	83	35
Donna Berns	36	83	35
Amy Uhrin	36	83	45
John Burke	36	82	45
K. Hammerstrom	36	91	37
Erik Eilers	36	92	37
Mark Fonseca	36	91	38
Christine Addison	36	90	38
Jeff Judas	36	97	18
Craig Bonn	36	97	18/26
James Bunn	36	95	27
John Burke	36	95	25/33

**June 30th, 2001**

Erik Eilers	36	96	30
Jeff Judas	36	95	30
K. Hammerstrom	36	95	42
Christine Addison	36	95	42
Mark Fonseca	21	61	26
Amy Uhrin	21	61	26
John Burke	21	60	34
Craig Bonn	21	61	34
Craig Bonn	36	82	33/40
Donna Berns	36	81	33

Christine Addison	36	80	49/50
K. Hammerstrom	36	81	45/49

**July 9th, 2001**

Jitka Hyniova	36	93	33
Kevin Kirsch	36	93	33
Christine Addison	36	93	39
Don Field	36	93	39

Jitka Hyniova	36	73	30/47
Donna Berns	36	73	30
Sean Meehan	36	73	37
Jud Kenworthy	36	73	37

Kevin Kirsch	36	54	25/31
Don Field	36	54	25/38
Christine Addison	36	54	38/44
Jud Kenworthy	36	54	38/59

James Bunn	36	52	37
Sean Meehan	36	52	38/51

**July 10th, 2001**

Jitka Hyniova	36	100	34
Donna Berns	36	100	34
Sean Meehan	36	99	31
Kevin Kirsch	36	95	31

Jitka Hyniova	36	68	32/45
Don Field	36	71	31
Christine Addison	36	70	40
Kevin Kirsch	36	68	39/50

Sean Meehan	36	60	33/39
Erik Eilers	36	60	33

Christine Addison	36	56	43/56
Jud Kenworthy	36	56	43

**July 11th, 2001**

Jitka Hyniova	36	96	35
Erik Eilers	36	97	35
Sean Meehan	36	96	32
Don Field	36	96	32

Kevin Kirsch	36	93	25
Jeff Judas	36	95	26
Christine Addison	36	95	32
Jud Kenworthy	36	95	32

Christine Addison	36	75	45/56
Donna Berns	36	75	45

**July 12th, 2001**

Kevin Kirsch	36	76	28
Jitka Hyniova	36	78	28
Christine Addison	36	77	41
Jud Kenworthy	36	79	41

Kevin Kirsch	36	75	29/40
Jitka Hyniova	36	77	29/40
Don Field	36	77	49
Sean Meehan	36	77	49

Christine Addison	36	76	45/50
Donna Berns	36	75	46

**July 17, 2001**

Mike Burton	36	109	23
Don Field	36	109	23
Jitka Hyniova	36	109	23
Ken Brennan	36	109	23

Mike Burton	36	102	19
Don Field	36	102	19
Jitka Hyniova	36	100	27
Ken Brennan	36	100	27

Mike Burton	36	97	23
Don Field	36	97	23
Jitka Hyniova	36	93	26

Ken Brennan	36	93	26
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**July 18, 2001**

Mike Burton	36	107	23
Don Field	36	107	23
Jitka Hyniova	36	103	21
Ken Brennan	36	103	21

Mike Burton	36	95	25
Don Field	36	95	25
Jitka Hyniova	36	97	21
Ken Brennan	36	97	21

Mike Burton	36	90	20
Don Field	36	90	20
Jitka Hyniova	36	90	29
Ken Brennan	36	90	29

**July 19, 2001**

Mike Burton	36	99	25
Don Field	36	99	25
Jitka Hyniova	36	98	28
Ken Brennan	36	98	28

Mike Burton	36	99	23
Don Field	36	99	23
Jitka Hyniova	36	99	25
Ken Brennan	36	99	25

**July 20, 2001**

Mike Burton	36	112	25
Don Field	36	112	25
Jitka Hyniova	36	112	25
Ken Brennan	36	112	25

Mike Burton	36	102	20
Don Field	36	102	20
Jitka Hyniova	36	101	23





### APPENDIX III. Sample Codes

fish video transect		FVT
fish visual census		FVC
SCUBA seine		SS
Tucker trawl		TUCK
Braun Blanquet		BB
benthic chl		CHL_BEN
water column chl		CHL_COL
water column nutrients		NUT_COL
stable isotope		
	phytoplankton	SI_PHYT
	fish	SI_FISH
	invertebrates	SI_INV
	macroalgae	SI_MAC
	benthic microalgae	SI_MIC
	seagrass	SI_SG
	coral	SI_COR
MiniBat tow		BAT
bongo tow		BONG
ROV		ROV
CTD		CTD
beam trawl		BEAM
drop camera		DROP
video sled		SLED
light profile		LGT
Secchi disk		SEC
QTC view		QTC
ROXANN		ROX
drifter		DRIFT
waypoint		WPT
PONAR grab		PONAR
Smith-Mac grab		SMAC
sediment torque		SED_TRQ
sediment penetrometry		SED_PEN
sediment sheer		SED_SHR
sediment particle size		SED_PART
Super VHS video		SVHS
regular VHS video		VHS
ASPEN file		ASP
seed cores		SEED
habitat video transect		HABTRAN
herbivory downrigger		HERB

## APPENDIX IV. Sample Log

Date	Start Time	Station #	Strata	Sample Code	Latitude	Longitude
6/17/01	21:38:11 EST	RNbound E	northern boundary	BEAM/ASP	24 44.7099130	82 53.259510
6/17/01	22:08:00 EST	ONbound E	northern boundary	BEAM	24 46.90	82 53.37
6/17/01	22:14:00 EST	ONbound E	northern boundary	BEAM	24 47.08	82 53.30
6/17/01	22:20:00 EST	ONbound E	northern boundary	BEAM	24 37.24	82 53.22
6/18/01		9807	RN	WPT	24 39.666 N	83 02.806 W
6/18/01		9807	RN	WPT	24 39.654	83 02.802
6/18/01	8:35:00 EST	9807	RN	DIVE	24 39.654	83 02.802
6/18/01	8:35:00 EST	9807	RN	SED_PEN	24 39.654	83 02.802
6/18/01	8:35:00 EST	9807	RN	SED_SHR	24 39.654	83 02.802
6/18/01	8:35:00 EST	9807	RN	CHL_BEN	24 39.654	83 02.802
6/18/01	8:35:00 EST	9807	RN	SED_PART	24 39.654	83 02.802
6/18/01	8:35:00 EST	9807	RN	HABTRAN	24 39.654	83 02.802
6/18/01	8:35:00 EST	9807	RN	FVC	24 39.654	83 02.802
6/18/01	10:00:00 EST	9807	RN	LGT	24 39.481	83 03.095
6/18/01		10105	RN	WPT	24 40.136	83 01.273
6/18/01	12:43:00 EST	10105	RN	DIVE	24 40.129	83 01.294
6/18/01	12:43:00 EST	10105	RN	SED_PEN	24 40.129	83 01.294
6/18/01	12:43:00 EST	10105	RN	SED_SHR	24 40.129	83 01.294
6/18/01	12:43:00 EST	10105	RN	CHL_BEN	24 40.129	83 01.294
6/18/01	12:43:00 EST	10105	RN	SED_PART	24 40.129	83 01.294
6/18/01	12:43:00 EST	10105	RN	HABTRAN	24 40.129	83 01.294
6/18/01	12:43:00 EST	10105	RN	FVC	24 40.129	83 01.294
6/18/01	12:52:00 EST	10105	RN	LGT	24 39.666	83 02.539
6/18/01	13:30:00 EST	10105	RN	SI_FISH		
6/18/01	13:30:00 EST	10105	RN	SI_FISH		
6/18/01	14:30:00 EST	10105	RN	SI_FISH		
6/18/01	12:43:00 EST	10105	RN	SI_COR	24 40.129	83 01.294
6/18/01	12:43:00 EST	10105	RN	SI_COR	24 40.129	83 01.294
6/18/01	18:29:02 UTC	9807	RN	BAT/QTC/ASP	24 40.3937794	83 02.4292718
6/18/01	18:29:02 UTC	9807	RN	SVHS		
6/18/01	18:29:02 UTC	9807	RN	VHS		
6/18/01	19:11:00 EST	9807	RN	SI_COR	24 39.654	83 02.802
6/18/01	19:11:00 EST	9807	RN	FVC	24 39.654	83 02.802
6/18/01	19:40:00 EST			SI_FISH	24 40.64	83 02.59
6/18/01	21:30:00 EST	9391	RN	BEAM/ASP	24 42.1329200	83 04.0019488
6/18/01	22:20:00 EST	10294	RN	BEAM/ASP		
6/19/01		12379	OS	WPT	24 35.910	83 05.203
6/19/01	8:36:00 EST	12379	OS	DIVE	24 35.905	83 05.225
6/19/01	8:36:00 EST	12379	OS	SED_PEN	24 40.129	83 01.294
6/19/01	8:36:00 EST	12379	OS	SED_SHR	24 40.129	83 01.294
6/19/01	8:36:00 EST	12379	OS	CHL_BEN	24 40.129	83 01.294
6/19/01	8:36:00 EST	12379	OS	SED_PART	24 40.129	83 01.294
6/19/01	8:36:00 EST	12379	OS	HABTRAN	24 40.129	83 01.294
6/19/01	8:36:00 EST	12379	OS	FVC	24 40.129	83 01.294
6/19/01	10:15:00 EST	12379	OS	LGT	24 35.869	83 06.388
6/19/01	10:28:00 EST	12379	OS	SEC	24 35.869	83 06.388

6/19/01		11460	ON	WPT	24 36.992	83 05.531
6/19/01	14:01:00 EST	11460	ON	DIVE	24 37.002	83 05.599
6/19/01	14:01:00 EST	11460	ON	SED_PEN	24 37.002	83 05.599
6/19/01	14:01:00 EST	11460	ON	SED_SHR	24 37.002	83 05.599
6/19/01	14:01:00 EST	11460	ON	CHL_BEN	24 37.002	83 05.599
6/19/01	14:01:00 EST	11460	ON	SED_PART	24 37.002	83 05.599
6/19/01	14:01:00 EST	11460	ON	HABTRAN	24 37.002	83 05.599
6/19/01	14:01:00 EST	11460	ON	FVC	24 37.002	83 05.599
6/19/01	15:42:00 EST	11460	ON	HERB	24 37.007	83 05.581
6/19/01	15:46:00 EST	11460	ON	HERB	24 37.019	83 05.603
6/19/01	15:49:00 EST	11460	ON	HERB	24 37.027	83 05.625
6/19/01	15:51:00 EST	11460	ON	HERB	24 37.038	83 05.653
6/19/01	15:53:00 EST	11460	ON	HERB	24 37.050	83 05.677
6/19/01	14:01:00 EST	11460	ON	SI_FISH	24 37.002	83 05.599
6/19/01	17:41:47 EST	12379	OS	BAT/QTC/ASP	24 36.0847921	83 05.2470100
6/19/01	21:19:11 EST	RNbound M	northern boundary	BEAM/ASP	24 44.7867249	82 58.6225848
6/19/01	21:48:39 EST	ONbound M	northern boundary	BEAM/ASP	24 47.0582724	82 58.4509550
6/20/01		10262	RS	WPT	24 39.7320	83 00.190
6/20/01	8:25:00 EST	10262	RS	DIVE	24 39.738	83 00.220
6/20/01	8:25:00 EST	10262	RS	SED_PEN	24 39.738	83 00.220
6/20/01	8:25:00 EST	10262	RS	SED_SHR	24 39.738	83 00.220
6/20/01	8:25:00 EST	10262	RS	CHL_BEN	24 39.738	83 00.220
6/20/01	8:25:00 EST	10262	RS	SED_PART	24 39.738	83 00.220
6/20/01	8:25:00 EST	10262	RS	HABTRAN	24 39.738	83 00.220
6/20/01	8:25:00 EST	10262	RS	FVC	24 39.738	83 00.220
6/20/01	14:05:01 UTC	10262	RS	BAT/QTC/ASP		
6/20/01	10:48:00 EST	10262	RS	LGT	24 39.94	83 00.14
6/20/01	11:02:00 EST	10262	RS	SEC	24 39.94	83 00.14
6/20/01		9042	RS	WPT	24 41.139	82 59.823
6/20/01	12:31:00 EST	9042	RS	DIVE	24 39.738	83 00.220
6/20/01	12:31:00 EST	9042	RS	SED_PEN	24 39.738	83 00.220
6/20/01	12:31:00 EST	9042	RS	SED_SHR	24 39.738	83 00.220
6/20/01	12:31:00 EST	9042	RS	CHL_BEN	24 39.738	83 00.220
6/20/01	12:31:00 EST	9042	RS	SED_PART	24 39.738	83 00.220
6/20/01	12:31:00 EST	9042	RS	HABTRAN	24 39.738	83 00.220
6/20/01	12:31:00 EST	9042	RS	FVC	24 39.738	83 00.220
6/20/01	15:02:15	9042	RS	BAT/QTC/ASP	24 41.0778927	83 00.0037939
6/20/01	13:19:00 EST	9042	RS	HERB	24 41.125	82 59.850
6/20/01	13:22:00 EST	9042	RS	HERB	24 41.123	82 59.866
6/20/01	13:25:00 EST	9042	RS	HERB	24 41.114	82 59.885
6/20/01	15:56:00 EST	9042	RS	HERB	24 41.105	82 59.870
6/20/01	16:08:00 EST	9042	RS	HERB	24 41.104	82 59.858
6/20/01		7265	OS	WPT	24 33.315	82 57.732
6/20/01	18:08:00 EST	7265	OS	DIVE	24 33.330	82 57.768
6/20/01	18:08:00 EST	7265	OS	SED_PEN	24 33.330	82 57.768
6/20/01	18:08:00 EST	7265	OS	SED_SHR	24 33.330	82 57.768
6/20/01	18:08:00 EST	7265	OS	CHL_BEN	24 33.330	82 57.768
6/20/01	18:08:00 EST	7265	OS	SED_PART	24 33.330	82 57.768
6/20/01	18:08:00 EST	7265	OS	HABTRAN	24 33.330	82 57.768
6/20/01	18:08:00 EST	7265	OS	FVC	24 33.330	82 57.768
6/20/01	18:08:00 EST	7265	OS	SI_COR	24 33.330	82 57.768
6/20/01	18:08:00 EST	7265	OS	SI_COR	24 33.330	82 57.768

6/20/01	18:08:00 EST	7265	OS	SI_COR	24 33.330	82 57.768
6/20/01	19:40:00 EST	7265	OS	DIVE/FVC	24 33.330	82 57.768
6/20/01	21:16:07 EST	7265	OS	BEAM/ASP	24 31.5802557	82 59.8846280
6/20/01	22:35:37 EST	6772	ON	BEAM/ASP	24 30.0349535	83 03.6396305
6/21/01		5527	ON	WPT	24 36.427	82 59.689
6/21/01	8:06:00 EST	5527	ON	DIVE	24 36.427	82 59.689
6/21/01	8:06:00 EST	5527	ON	SED_PEN	24 36.427	82 59.689
6/21/01	8:06:00 EST	5527	ON	SED_SHR	24 36.427	82 59.689
6/21/01	8:06:00 EST	5527	ON	CHL_BEN	24 36.427	82 59.689
6/21/01	8:06:00 EST	5527	ON	SED_PART	24 36.427	82 59.689
6/21/01	8:06:00 EST	5527	ON	HABTRAN	24 36.427	82 59.689
6/21/01	8:06:00 EST	5527	ON	FVC	24 36.427	82 59.689
6/21/01	10:07:42EST	5527	ON	BAT/QTC/ASP	24 36.5458163	82 59.8486295
6/21/01		7675	OS	WPT	24 32.234	82 57.040
6/21/01	12:31:00	7675	OS	DIVE	24 32.245	82 57.064
6/21/01	12:31:00	7675	OS	SED_PEN	24 32.245	82 57.064
6/21/01	12:31:00	7675	OS	SED_SHR	24 32.245	82 57.064
6/21/01	12:31:00	7675	OS	CHL_BEN	24 32.245	82 57.064
6/21/01	12:31:00	7675	OS	SED_PART	24 32.245	82 57.064
6/21/01	12:31:00	7675	OS	HABTRAN	24 32.245	82 57.064
6/21/01	12:31:00	7675	OS	FVC	24 32.245	82 57.064
6/21/01	18:21:13UTC	7675	OS	BAT/QTC/ASP	24 32.1675506	82 57.2096745
6/21/01		6772	ON	WPT	24 34.339	82 58.647
6/21/01	17:56:00	6772	ON	DIVE	24 34.358	82 58.671
6/21/01	17:56:00	6772	ON	SED_PEN	24 34.358	82 58.671
6/21/01	17:56:00	6772	ON	SED_SHR	24 34.358	82 58.671
6/21/01	17:56:00	6772	ON	CHL_BEN	24 34.358	82 58.671
6/21/01	17:56:00	6772	ON	SED_PART	24 34.358	82 58.671
6/21/01	17:56:00	6772	ON	HABTRAN	24 34.358	82 58.671
6/21/01	17:56:00	6772	ON	FVC	24 34.358	82 58.671
6/21/01	17:56:00	6772	ON	SI_COR	24 34.358	82 58.671
6/21/01	17:56:00	6772	ON	SI_COR	24 34.358	82 58.671
6/21/01	17:56:00	6772	ON	SI_COR	24 34.358	82 58.671
6/21/01	19:33:00 EST	6772	ON	DIVE/FVC	24 34.358	82 58.671
6/21/01	21:11:52 EST	3275	PN	BEAM/ASP	24 39.8688707	82 58.4382687
6/22/01	7:11:00 EST	2780	PS	DIVE		

6/25/01	20:40:29	RNbound E	northern boundary	BEAM/ASP	24 45.7143574	82 53.7198611
6/25/01	20:40:29	RNbound E	northern boundary	SI_FISH		
6/25/01	20:30:00 EST	RNbound E	northern boundary	PONAR	24 45.8435852	82 53.50884905
6/25/01	20:30:00 EST	RNbound E	northern boundary	SI_PHYTO	24 45.8435852	82 53.50884905
6/25/01	20:30:00 EST	RNbound E	northern boundary	CHL_COL	24 45.8435852	82 53.50884905
6/25/01	20:30:00 EST	RNbound E	northern boundary	SI_MICRO	24 45.8435852	82 53.50884905
6/25/01	20:30:00 EST	RNbound E	northern boundary	SED_PART	24 45.8435852	82 53.50884905
6/25/01	20:30:00 EST	RNbound E	northern boundary	CHL_BEN	24 45.8435852	82 53.50884905
6/25/01	21:54:00 EST	ONbound W	northern boundary	BEAM/ASP	24.77878749	83.02205182

6/25/01	21:54:00 EST	ONbound W	northern boundary	SI_FISH	24.77878749	83.02205182
6/25/01	21:54:00 EST	ONbound W	northern boundary	SI_FISH	24.77878749	83.02205182
6/25/01	21:54:00 EST	ONbound W	northern boundary	SI_FISH	24.77878749	83.02205182
6/25/01	21:54:00 EST	ONbound W	northern boundary	SI_FISH	24.77878749	83.02205182
6/25/01	22:27:25 EST	RNbound W	northern boundary	BEAM/ASP	24.74615789	83.021286294
6/25/01	22:27:25 EST	RNbound W	northern boundary	SI_FISH	24.74615789	83.021286294
6/25/01	22:27:25 EST	RNbound W	northern boundary	SI_FISH	24.74615789	83.021286294
6/25/01	22:27:25 EST	RNbound W	northern boundary	SI_FISH	24.74615789	83.021286294
6/25/01	22:27:25 EST	RNbound W	northern boundary	SI_FISH	24.74615789	83.021286294
6/25/01	22:27:25 EST	RNbound W	northern boundary	SI_FISH	24.74615789	83.021286294
6/26/01	12:50:00	23065		DRIFT/ASP	24 30.58	83 06.61
6/26/01		8233	RS	WPT	24 42.865	82 58.649
6/26/01	08:20:00 EST	8233	RS	DIVE	24 42.846	82 58.653
6/26/01	08:20:00 EST	8233	RS	SED_PEN	24 42.846	82 58.653
6/26/01	08:20:00 EST	8233	RS	SED_SHR	24 42.846	82 58.653
6/26/01	08:20:00 EST	8233	RS	CHL_BEN	24 42.846	82 58.653
6/26/01	08:20:00 EST	8233	RS	SI_MICRO	24 42.846	82 58.653
6/26/01	08:20:00 EST	8233	RS	SED_PART	24 42.846	82 58.653
6/26/01	08:20:00 EST	8233	RS	HABTRAN	24 42.846	82 58.653
6/26/01	08:20:00 EST	8233	RS	FVC	24 42.846	82 58.653
6/26/01	10:00:01 EST	8233	RS	BAT/QTC/ASP	24.71216568	82.980972089
6/26/01	18:50:45 UTC	8233	RS	VHS		
6/26/01	18:50:45 UTC	8233	RS	SVHS		
6/26/01	10:51:00 EST	8233	RS	LGT	24 43.073	82 59.122
6/26/01		9162	RS	WPT	24 40.836	82 59.727
6/26/01	13:22:00 EST	9162	RS	DIVE	24 40.838	82 59.706
6/26/01	13:22:00 EST	9162	RS	SED_PEN	24 40.838	82 59.706
6/26/01	13:22:00 EST	9162	RS	SED_SHR	24 40.838	82 59.706
6/26/01	13:22:00 EST	9162	RS	CHL_BEN	24 40.838	82 59.706
6/26/01	13:22:00 EST	9162	RS	SED_PART	24 40.838	82 59.706
6/26/01	13:22:00 EST	9162	RS	SI_MICRO	24 40.838	82 59.706
6/26/01	14:50:49 EST	9162	RS	BAT/QTC/ASP	24.68103492	82.998237435
6/26/01	20:17:32 UTC	9162	RS	VHS		
6/26/01	18:50:00 UTC	9162	RS	SVHS		
6/26/01	18:48:00 EST	9162	RS	DIVE	24 40.838	82 59.706
6/26/01	18:48:00 EST	9162	RS	FVC	24 40.838	82 59.706
6/26/01	18:48:00 EST	9162	RS	HABTRAN	24 40.838	82 59.706
6/26/01	19:45:00 EST	9162	RS	DIVE/FVC	24 40.838	82 59.706
6/26/01	21:52:07 EST	10529	RS	BEAM/ASP	24.63547778	82.002530989
6/26/01	21:52:07 EST	10529	RS	SI_FISH	24.63547778	82.002530989
6/26/01	21:52:07 EST	10529	RS	SI_FISH	24.63547778	82.002530989
6/26/01	21:52:07 EST	10529	RS	SI_FISH	24.63547778	82.002530989
6/26/01	21:52:07 EST	10529	RS	SI_FISH	24.63547778	82.002530989

6/26/01	21:52:07 EST	10529	RS	SI_FISH	24.63547778	82.002530989
6/26/01	21:52:07 EST	10529	RS	SI_FISH	24.63547778	82.002530989
6/26/01	21:52:07 EST	10529	RS	SI_FISH	24.63547778	82.002530989
6/26/01	21:52:07 EST	10529	RS	SI_FISH	24.63547778	82.002530989
6/26/01	21:52:07 EST	10529	RS	SI_FISH	24.63547778	82.002530989
6/26/01	21:52:07 EST	10529	RS	SI_INV	24.63547778	82.002530989
6/27/01	08:00:00 EST	5842	ON	SI_PHYTO	24.5944	82.9989
6/27/01	08:00:00 EST	5842	ON	CHL_COL	24.5944	82.9989
6/27/01		5842	ON	WPT	24 35.400	82 59.645
6/27/01	9:00:00 EST	5842	ON	DIVE	24 35.346	82 59.638
6/27/01	9:00:00 EST	5842	ON	SED_PEN	24 35.346	82 59.638
6/27/01	9:00:00 EST	5842	ON	SED_SHR	24 35.346	82 59.638
6/27/01	9:00:00 EST	5842	ON	CHL_BEN	24 35.346	82 59.638
6/27/01	9:00:00 EST	5842	ON	SI_MICRO	24 35.346	82 59.638
6/27/01	9:00:00 EST	5842	ON	SED_PART	24 35.346	82 59.638
6/27/01	9:00:00 EST	5842	ON	FVC	24 35.346	82 59.638
6/27/01	9:00:00 EST	5842	ON	HABTRAN	24 35.346	82 59.638
6/27/01	11:24:49 EST	5842	ON	BAT/QTC/ASP	24.58930637	82.004361847
6/27/01	15:25:09 UTC	5842	ON	VHS		
6/27/01	15:25:09 UTC	5842	ON	SVHS		
6/27/01	12:01:40 EST	transit		BAT/QTC/ASP	24.59340106	82.989152633
6/27/01	15:59:08 UTC	transit		VHS		
6/27/01	15:59:08 UTC	transit		SVHS		
6/27/01	13:08:07 EST	3275	PN	BAT/QTC/ASP	24.65868424	82.952828941
6/27/01	17:09:40 UTC	3275	PN	VHS		
6/27/01	17:09:40 UTC	3275	PN	SVHS		
6/27/01		3275	PN	WPT	24 39.34044	82 57.15104
6/27/01	14:13:00 EST	3275	PN	DIVE	24 39.351	82 57.191
6/27/01	14:13:00 EST	3275	PN	FVC	24 39.351	82 57.191
6/27/01	14:13:00 EST	3275	PN	HABTRAN	24 39.351	82 57.191
6/27/01		3120	PN	SI_PHYTO	24.5981	82.9776
6/27/01		3120	PN	CHL_COL	24.5981	82.9776
6/27/01		3120	PN	WPT	24 39.463	82 56.563
6/27/01	15:48:00 EST	3120	PN	DIVE	24 39 27.82263	82 56 33.81720
6/27/01	15:48:00 EST	3120	PN	SED_PEN	24 39 27.82263	82 56 33.81720
6/27/01	15:48:00 EST	3120	PN	SED_SHR	24 39 27.82263	82 56 33.81720
6/27/01	15:48:00 EST	3120	PN	CHL_BEN	24 39 27.82263	82 56 33.81720
6/27/01	15:48:00 EST	3120	PN	SED_PART	24 39 27.82263	82 56 33.81720
6/27/01	15:48:00 EST	3120	PN	FVC	24 39 27.82263	82 56 33.81720
6/27/01	15:48:00 EST	3120	PN	HABTRAN	24 39 27.82263	82 56 33.81720
6/27/01	15:48:00 EST	3120	PN	SI_MICRO		
6/27/01	17:55:22 EST	3120	PN	BAT/QTC/ASP	24.66066163	82.948237
6/27/01	21:54:54 UTC	3120	PN	VHS		
6/27/01	21:54:54 UTC	3120	PN	SVHS		
6/27/01	19:30:00 EST	3120	PN	DIVE	24 39 27.82263	82 56 33.81720

6/27/01	20:50:10 EST	5842	ON	BEAM/ASP	24.60030668	82.015295303
6/27/01	20:50:10 EST	5842	ON	SI_FISH	24.60030668	82.015295303
6/27/01	20:50:10 EST	5842	ON	SI_FISH	24.60030668	82.015295303
6/27/01	20:50:10 EST	5842	ON	SI_FISH	24.60030668	82.015295303
6/27/01	21:47:13 EST	11460	ON	BEAM/ASP	24.59959031	83.106420249
6/27/01	21:47:13 EST	11460	ON	SI_FISH	24.59959031	83.106420249
6/27/01	21:47:13 EST	11460	ON	SI_FISH	24.59959031	83.106420249
6/27/01	21:47:13 EST	11460	ON	SI_FISH	24.59959031	83.106420249
6/27/01	21:47:13 EST	11460	ON	SI_FISH	24.59959031	83.106420249
6/27/01	21:47:13 EST	11460	ON	SI_FISH	24.59959031	83.106420249
6/27/01	21:47:13 EST	11460	ON	SI_FISH	24.59959031	83.106420249
6/27/01	21:47:13 EST	11460	ON	SI_INV	24.59959031	83.106420249
6/27/01	21:47:13 EST	11460	ON	SI_INV	24.59959031	83.106420249
6/28/01		9498	RN	WPT	24 40.693	83 03.002
6/28/01	9:39:00	9498	RN	DIVE	24 40.755	83 02.923
6/28/01	9:39:00	9498	RN	SED_PEN	24 40.755	83 02.923
6/28/01	9:39:00	9498	RN	SED_SHR	24 40.755	83 02.923
6/28/01	9:39:00	9498	RN	CHL_BEN	24 40.755	83 02.923
6/28/01	9:39:00	9498	RN	SED_PART	24 40.755	83 02.923
6/28/01	9:39:00	9498	RN	FVC	24 40.755	83 02.923
6/28/01	9:39:00	9498	RN	HABTRAN	24 40.755	83 02.923
6/28/01	9:39:00	9498	RN	SI_MICRO	24 40.755	83 02.923
6/28/01	08:12:27 EST	9498	RN	CHL_COL	24.676	83.0649
6/28/01	08:12:27 EST	9498	RN	SI_PHYTO	24.676	83.0649
6/28/01	14:57:33 UTC	9498	RN	BAT/ASP	24.66955431	83.058386901
6/28/01	14:57:33 UTC	9498	RN	QTC		
6/28/01	14:57:33 UTC	9498	RN	VHS		
6/28/01	14:57:33 UTC	9498	RN	SVHS		
6/28/01	15:34:38 UTC		transit run	BAT/QTC/ASP	24.68362073	83.045126516
6/28/01	15:34:38 UTC		transit run	VHS		
6/28/01	15:34:38 UTC		transit run	SVHS		
6/28/01	15:58:37 UTC	10529	RS	BAT/ASP/QTC	24.66004239	83.026672749
6/28/01	15:58:17 UTC	10529	RS	VHS		
6/28/01	15:58:17 UTC	10529	RS	SVHS		
6/28/01		1915	RN	WPT	24 42.168	82 55.692
6/28/01	14:35:00	1915	RN	DIVE	24 42.189	82 55.689
6/28/01	14:35:00	1915	RN	SED_PEN	24 42.189	82 55.689
6/28/01	14:35:00	1915	RN	SED_SHR	24 42.189	82 55.689
6/28/01	14:35:00	1915	RN	CHL_BEN	24 42.189	82 55.689
6/28/01	14:35:00	1915	RN	SED_PART	24 42.189	82 55.689
6/28/01	14:35:00	1915	RN	FVC	24 42.189	82 55.689
6/28/01	14:35:00	1915	RN	HABTRAN	24 42.189	82 55.689
6/28/01	14:35:00	1915	RN	SI_MICRO	24 42.189	82 55.689
6/28/01	13:45:00 EST	1915	RN	LGT	24 41.896	82 56.359
6/28/01	13:45:00 EST	1915	RN	SEC	24 41.896	82 56.359
6/28/01	13:45:00 EST	1915	RN	CHL_COL	24.6993	82.9333
6/28/01	13:45:00 EST	1915	RN	SI_PHYTO	24.6993	82.9333
6/28/01	10:15:52 EST	1915	RN	BEAM/ASP	24.70665812	82.932714764
6/28/01	10:15:52 EST	1915	RN	SI_INV	24.70665812	82.932714764
6/28/01	10:15:52 EST	1915	RN	SI_INV	24.70665812	82.932714764

6/29/01	11:34:58 UTC	1915	RN	BAT/QTC/ASP	24.7044169	82.927041537
6/29/01	11:34:33 UTC	1915	RN	VHS		
6/29/01	11:34:33 UTC	1915	RN	SVHS		
6/29/01		1915	RN	WPT	24 41.375	82 56.253
6/29/01	09:40:00 EST	10529	RS	CHL_COL	24.6608	83.0106
6/29/01	09:40:00 EST	10529	RS	SI_PHYTO	24.6608	83.0106
6/29/01		10529	RS	WPT	24 39.584	83 01.375
6/29/01	08:46:00 EST	10529	RS	DIVE	24 39 34.50740	83 01 23.88473
6/29/01	08:46:00 EST	10529	RS	SED_PEN	24 39 34.50740	83 01 23.88473
6/29/01	08:46:00 EST	10529	RS	SED_SHR	24 39 34.50740	83 01 23.88473
6/29/01	08:46:00 EST	10529	RS	CHL_BEN	24 39 34.50740	83 01 23.88473
6/29/01	08:46:00 EST	10529	RS	SED_PART	24 39 34.50740	83 01 23.88473
6/29/01	08:46:00 EST	10529	RS	FVC	24 39 34.50740	83 01 23.88473
6/29/01	08:46:00 EST	10529	RS	HABTRAN	24 39 34.50740	83 01 23.88473
6/29/01	10:04:00 EST	10529	RS	LGT	24 39.703	83 01.111
6/29/01	10:04:00 EST	10529	RS	SEC	24 39.703	83 01.111
6/29/01		8924	RN	WPT	24 41.006	83 00.815
6/29/01	13:36:00 EST	8924	RN	DIVE	24 41.006	83 00.815
6/29/01	13:36:00 EST	8924	RN	SED_PEN	24 41.006	83 00.815
6/29/01	13:36:00 EST	8924	RN	SED_SHR	24 41.006	83 00.815
6/29/01	13:36:00 EST	8924	RN	CHL_BEN	24 41.006	83 00.815
6/29/01	13:36:00 EST	8924	RN	SED_PART	24 41.006	83 00.815
6/29/01	13:36:00 EST	8924	RN	FVC	24 41.006	83 00.815
6/29/01	13:36:00 EST	8924	RN	HABTRAN	24 41.006	83 00.815
6/29/01	13:55:00 EST	8924	RN	LGT	24 41.218	83 01.471
6/29/01	13:55:00 EST	8924	RN	SEC	24 41.218	83 01.471
6/29/01	14:42:27 EST	8924	RN	BAT/QTC/ASP	24.68598846	83.019771363
6/29/01		8924	RN	VHS		
6/29/01		8924	RN	SVHS		
6/29/01	17:50:00 EST	3275	PN	DIVE	24 39.351	82 57.191
6/29/01		3275	PN	WPT	24 39.390	82 57.058
6/29/01	07:48:00 EST	3275	PN	DIVE	24 39.4058115	82 57.0492285
6/30/01	07:48:00 EST	94	ON	WPT	24 44.2690398	82 47.6128782
6/30/01	07:48:00 EST	94	ON	DIVE	24 44.2679773	82 47.6089420
6/30/01	07:48:00 EST	94	ON	SED_PEN	24 44.2679773	82 47.6089420
6/30/01	07:48:00 EST	94	ON	SED_SHR	24 44.2679773	82 47.6089420
6/30/01	07:48:00 EST	94	ON	CHL_BEN	24 44.2679773	82 47.6089420
6/30/01	07:48:00 EST	94	ON	SED_PART	24 44.2679773	82 47.6089420
6/30/01	07:48:00 EST	94	ON	FVC	24 44.2679773	82 47.6089420
6/30/01	07:48:00 EST	94	ON	HABTRAN	24 44.2679773	82 47.6089420
6/30/01	08:45:00 EST	94	ON	CHL_COL	24.44	82.4767
6/30/01	08:45:00 EST	94	ON	SI_PHYTO	24.44	82.4767
6/30/01	09:43:19EST	94	ON	BAT/QTC/ASP	24.73442641	82.790699194
6/30/01	13:56:54 UTC	94	ON	VHS		
6/30/01	13:56:54 UTC	94	ON	SVHS		
6/30/01		1864	OS	WPT	24 42.90047	82 46.8309
6/30/01	11:55:00 EST	1864	OS	DIVE	24 42.90047	82 46.8309



6/30/01	11:55:00 EST	1864	OS	SED_PEN	24 42.90047	82 46.8309
6/30/01	11:55:00 EST	1864	OS	SED_SHR	24 42.90047	82 46.8309
6/30/01	11:55:00 EST	1864	OS	CHL_BEN	24 42.90047	82 46.8309
6/30/01	11:55:00 EST	1864	OS	SED_PART	24 42.90047	82 46.8309
6/30/01	11:55:00 EST	1864	OS	FVC	24 42.90047	82 46.8309
6/30/01	11:55:00 EST	1864	OS	HABTRAN	24 42.90047	82 46.8309
6/30/01	13:53:11 EST	1864	OS	BAT/QTC/ASP	24.7175218	82.781904008
6/30/01	18:07:57 UTC	1864	OS	VHS		
6/30/01	18:07:57 UTC	1864	OS	SVHS		
6/30/01	14:23:17 EST		transit run	BAT/QTC/ASP	24.70963256	82.774257329
6/30/01	18:36:53 UTC		transit run	VHS		
6/30/01	18:36:53 UTC		transit run	SVHS		
6/30/01	17:16:40 UTC	6731	OS	BAT/QTC/ASP	24.56876273	82.919039694
6/30/01	21:32:20 UTC	6731	OS	VHS		
6/30/01	21:32:20 UTC	6731	OS	SVHS		
6/30/01	18:50:00 EST	6731	OS	CHL_COL	24.5665	82.9131
6/30/01	18:50:00 EST	6731	OS	SI_PHYTO	24.5665	82.9131
6/30/01		6731	OS	WPT	24 33.891971	82 54.5030470
6/30/01	18:53:00 EST	6731	OS	DIVE	24 33.891971	82 54.5030470
6/30/01	18:53:00 EST	6731	OS	SED_PEN	24 33.891971	82 54.5030470
6/30/01	18:53:00 EST	6731	OS	SED_SHR	24 33.891971	82 54.5030470
6/30/01	18:53:00 EST	6731	OS	CHL_BEN	24 33.891971	82 54.5030470
6/30/01	18:53:00 EST	6731	OS	SED_PART	24 33.891971	82 54.5030470
6/30/01	18:53:00 EST	6731	OS	FVC	24 33.891971	82 54.5030470
6/30/01	18:53:00 EST	6731	OS	HABTRAN	24 33.891971	82 54.5030470
6/30/01	22:11:57 EST	8233	RS	BEAM/ASP	24.71567963	82.976964238
7/8/01	18:23:22 EST		tort south	DRIFT/ASP	24 28.9871201	83 06.0059382
7/8/01	18:34:10 EST		tort south	DRIFT/ASP	24 28.9917376	83 08.0009963
7/8/01	18:44:00 EST		tort south	DRIFT/ASP	24 30.0279741	83 06.9998228
7/8/01	18:57:20 EST		tort south	NUT_COL	24 30.6	83 05.8
7/8/01	18:57:20 EST		tort south	CHL_COL	24 30.6	83 05.8
7/8/01	19:00:00 EST		tort south	NUT_COL	24 30.6	83 05.8
7/8/01	19:00:00 EST		tort south	CHL_COL	24 30.6	83 05.8
7/8/01	19:56:14 EST	12379	OS	NUT_COL	24 35.455	83 04.661
7/8/01	19:56:14 EST	12379	OS	CHL_COL	24 35.455	83 04.661
7/8/01	19:56:14 EST	12379	OS	NUT_COL	24 35.455	83 04.661
7/8/01	19:56:14 EST	12379	OS	CHL_COL	24 35.455	83 04.661
7/8/01	19:56:14 EST	12379	OS	SI_PHYT	24 35.455	83 04.661
7/8/01	21:14:40 EST	12379	OS	BEAM/ASP	24 35.5089932	83 04.7620901
7/8/01	21:14:40 EST	12379	OS	SI_FISH	24 35.5089932	83 04.7620901
7/8/01	21:14:40 EST	12379	OS	SI_INV	24 35.5089932	83 04.7620901
7/8/01	21:14:40 EST	12379	OS	SI_FISH	24 35.5089932	83 04.7620901
7/8/01	21:14:40 EST	12379	OS	SI_FISH	24 35.5089932	83 04.7620901
7/8/01	21:14:40 EST	12379	OS	SI_FISH	24 35.5089932	83 04.7620901
7/8/01	21:14:40 EST	12379	OS	SI_MAC	24 35.5089932	83 04.7620901
7/8/01	22:06:25 EST		channel	BEAM/ASP	24.60326177	83.009971369
7/8/01	22:06:25 EST		channel	SI_MAC	24.60326177	83.009971369
7/9/01	07:36:40 EST	3275	PN	NUT_COL	24 39.543	82 56.943
7/9/01	07:36:40 EST	3275	PN	CHL_COL	24 39.543	82 56.943
7/9/01	08:17 EST	3275	PN	DIVE	24 39.4058115	82 57.0492285

7/9/01	08:17 EST	3275	PN	SED_PEN	24 39.4058115	82 57.0492285
7/9/01	08:17 EST	3275	PN	SED_SHR	24 39.4058115	82 57.0492285
7/9/01	08:17 EST	3275	PN	CHL_BEN	24 39.4058115	82 57.0492285
7/9/01	08:17 EST	3275	PN	SED_PART	24 39.4058115	82 57.0492285
7/9/01	08:17 EST	3275	PN	SI_MIC	24 39.4058115	82 57.0492285
7/9/01	08:58 EST	3275	PN	FVC	24 39.4058115	82 57.0492285
7/9/01	08:58 EST	3275	PN	HABTRAN	24 39.4058115	82 57.0492285
7/9/01	08:25 est	3275	PN	NUT_COL	24 39.813	82 56.733
7/9/01	08:25 est	3275	PN	CHL_COL	24 39.813	82 56.733
7/9/01	08:25 est	3275	PN	SI_PHYT	24 39.813	82 56.733
7/9/01	15:13:34 UTC	6108	PS	ASP/BAT/QTC	24 35.1911139	82 53.259065
7/9/01	15:13:13 UTC	6108	PS	VHS		
7/9/01	15:13:13 UTC	6108	PS	SVHS		
7/9/01	12:15 EST	6108	PS	NUT_COL	24 35.29	82 53.06
7/9/01	12:15 EST	6108	PS	CHL_COL	24 35.29	82 53.06
					24 35	
7/9/01	12:50 EST	6108	PS	DIVE	16.27461	82 53 07.11930
					24 35	
7/9/01	12:50 EST	6108	PS	SED_PEN	16.27461	82 53 07.11930
					24 35	
7/9/01	12:50 EST	6108	PS	SED_SHR	16.27461	82 53 07.11930
					24 35	
7/9/01	12:50 EST	6108	PS	CHL_BEN	16.27461	82 53 07.11930
					24 35	
7/9/01	12:50 EST	6108	PS	SED_PART	16.27461	82 53 07.11930
					24 35	
7/9/01	12:50 EST	6108	PS	SI_MAC	16.27461	82 53 07.11930
					24 35	
7/9/01	12:50 EST	6108	PS	SI_SG	16.27461	82 53 07.11930
					24 35	
7/9/01	12:50 EST	6108	PS	SI_MIC	16.27461	82 53 07.11930
					24 35	
7/9/01	12:50 EST	6108	PS	SI_SG	16.27461	82 53 07.11930
					24 35	
7/9/01	13:20 EST	6108	PS	FVC	16.27461	82 53 07.11930
					24 35	
7/9/01	13:20 EST	6108	PS	HABTRAN	16.27461	82 53 07.11930
7/9/01	12:40 EST	6108	PS	LGT	24 35.042	82 52.766
7/9/01	12:40 EST	6108	PS	CHL_COL	24 35.042	82 52.766
7/9/01	12:40 EST	6108	PS	NUT_COL	24 35.042	82 52.766
7/9/01	12:40 EST	6108	PS	SI_PHYT	24 35.042	82 52.766
7/9/01	08:25 est	3275	PN	SI_PHYT	24 39.813	82 56.733
7/9/01	20:04:50 utc	2780	PS	ASP	24 40.207206	82 46.8644844
7/9/01	19:44:35 UTC	2780	PS	QTC	24 40.4	82 46.9
7/9/01	19:44:29 UTC	2780	PS	BAT	24 40.4	82 46.9
7/9/01	20:07:57 UTC	2780	PS	BAT		
7/9/01	19:48:08 UTC	2780	PS	VHS	24 40.4	82 46.9
7/9/01	19:48:08 UTC	2780	PS	SVHS	24 40.4	82 46.9
7/9/01	17:35 EST	2780	PS	DIVE	24 40.4016777	82 46.8542090
7/9/01	17:35 EST	2780	PS	SED_PEN	24 40.4016777	82 46.8542090
7/9/01	17:35 EST	2780	PS	SED_SHR	24 40.4016777	82 46.8542090
7/9/01	17:35 EST	2780	PS	CHL_BEN	24 40.4016777	82 46.8542090
7/9/01	17:35 EST	2780	PS	SED_PART	24 40.4016777	82 46.8542090
7/9/01	17:35 EST	2780	PS	SI_SG	24 40.4016777	82 46.8542090
7/9/01	17:35 EST	2780	PS	SI_MAC	24 40.4016777	82 46.8542090

7/9/01	17:35 EST	2780	PS	SI_MAC	24 40.4016777	82 46.8542090
7/9/01	17:35 EST	2780	PS	SI_MAC	24 40.4016777	82 46.8542090
7/9/01	17:35 EST	2780	PS	SI_SG	24 40.4016777	82 46.8542090
7/9/01	18:06 EST	2780	PS	FVC	24 40.4016777	82 46.8542090
7/9/01	18:06 EST	2780	PS	HABTRAN	24 40.4016777	82 46.8542090
7/9/01	17:32 EST	2780	PS	NUT_COL	24 40.223	82 46.700
7/9/01	17:32 EST	2780	PS	CHL_COL	24 40.223	82 46.700
7/9/01	17:32 EST	2780	PS	SI_PHYT	24 40.223	82 46.700
7/9/01	17:32 EST	2780	PS	NUT_COL	24 40.223	82 46.700
7/9/01	17:32 EST	2780	PS	CHL_COL	24 40.223	82 46.700
7/9/01	19:39 EST	2780	PS	DIVE/FVC	24 40.4016777	82 46.8542090
7/9/01	19:39 EST	2780	PS	SI_FISH	24 40.4016777	82 46.8542090
7/9/01	18:00 EST	2780	PS	SI_FISH	24 40.4016777	82 46.8542090
7/10/01	0752 est	1136	PN	NUT_COL	24 43.132	82 52.5016
7/10/01	0752 est	1136	PN	CHL_COL	24 43.132	82 52.5016
7/10/01	0752 est	1136	PN	SI_PHYT	24 43.132	82 52.5016
7/10/01	0851 est	1136	PN	NUT_COL	24 43.179	82 52.241
7/10/01	0851 est	1136	PN	CHL_COL	24 43.179	82 52.241
7/10/01	807 est	1136	PN	DIVE	16.30466	82 52 28.73809
7/10/01	807 est	1136	PN	SED_PEN	16.30466	82 52 28.73809
7/10/01	807 est	1136	PN	SED_SHR	16.30466	82 52 28.73809
7/10/01	807 est	1136	PN	CHL_BEN	16.30466	82 52 28.73809
7/10/01	807 est	1136	PN	SED_PART	16.30466	82 52 28.73809
7/10/01	851 est	1136	PN	FVC	16.30466	82 52 28.73809
7/10/01	851 est	1136	PN	HABTRAN	16.30466	82 52 28.73809
7/10/01	1335 EST	3926	PS	DIVE	24.82747	82 47 29.57554
7/10/01	1335 EST	3926	PS	SED_PEN	24.82747	82 47 29.57554
7/10/01	1335 EST	3926	PS	SED_SHR	24.82747	82 47 29.57554
7/10/01	1335 EST	3926	PS	CHL_BEN	24.82747	82 47 29.57554
7/10/01	1335 EST	3926	PS	SED_PART	24.82747	82 47 29.57554
7/10/01	1419 EST	3926	PS	FVC	24.82747	82 47 29.57554
7/10/01	1419 EST	3926	PS	HABTRAN	24.82747	82 47 29.57554
7/10/01	13:48:52 UTC	1136	PN	ASP/BAT/QTC	24 43.3838053	82 52.6380636
7/10/01	13:50:50 UTC	1136	PN	VHS		
7/10/01	13:50:50 UTC	1136	PN	SVHS		
7/10/01	16:22:58 UTC	3926	PS	ASP/BAT/QTC	24 38.5113459	82 47.4449805
7/10/01	16:31:10 UTC	3926	PS	VHS		
7/10/01	16:31:10 UTC	3926	PS	SVHS		
7/10/01	1420 EST	3926	PS	NUT_COL	24 38.149	82 47.287
7/10/01	1420 EST	3926	PS	CHL_COL	24 38.149	82 47.287
7/10/01	14:29 EST	3926	PS	NUT_COL	24 38.083	82 47.263

7/10/01	14:29 EST	3926	PS	CHL_COL	24 38.083	82 47.263
7/10/01	21:30:15 UTC	10105	RN	NUT_COL		
7/10/01		10105	RN	CHL_COL		
7/10/01	21:42:07 UTC	10105	RN	ASP/BAT/QTC	24 40.1338045	83 01.441941
7/10/01	21:42:40 UTC	10105	RN	VHS		
7/10/01	21:42:40 UTC	10105	RN	SVHS		
7/10/01	1933 EST	9807	RN	DIVE/FVC	24 39.654	83 02.802
7/10/01	19:00 EST	9807	RN	WPT	24 39.664	83 02.669
7/10/01	19:15 EST	9807	RN	DIVE	24 39.664	83 02.669
7/10/01	19:15 EST	9807	RN	SI_FISH	24 39.664	83 02.669
7/10/01	19:15 EST	9807	RN	SI_FISH	24 39.664	83 02.669
7/10/01	19:15 EST	9807	RN	SI_FISH	24 39.664	83 02.669
7/10/01	19:15 EST	9807	RN	SI_FISH	24 39.664	83 02.669
7/10/01	2135 EST	8924	RN	NUT_COL	24 44.424	83 02.106
7/10/01	2135 EST	8924	RN	CHL_COL	24 44.424	83 02.106
7/10/01	20:45 EST	8924	RN	BEAM/ASP	24 44.2460085	83 02.0440849
7/10/01	20:45 EST	8924	RN	SI_FISH	24 44.2460085	83 02.0440849
7/10/01	20:45 EST	8924	RN	SI_INV	24 44.2460085	83 02.0440849
7/10/01	20:45 EST	8924	RN	SI_INV	24 44.2460085	83 02.0440849
7/10/01	20:45 EST	8924	RN	SI_PHY	24 44.2460085	83 02.0440849
7/10/01	10:49 EST	10262	RS	BEAM/ASP	24 38.6711237	82 59.3689414
7/11/01	7:38 EST	11460	ON	NUT_COL	24 37.074	83 05.548
7/11/01	7:38 EST	11460	ON	CHL_COL	24 37.074	83 05.548
7/11/01	7:46 EST	11460	ON	NUT_COL	24 37.120	83 05.444
7/11/01	7:46 EST	11460	ON	CHL_COL	24 37.120	83 05.444
7/11/01	7:46 EST	11460	ON	SI_FISH	24 37.120	83 05.444
7/11/01	11:59:26 UTC	11460	ON	ASP/BAT/QTC	24 37343175	83 05.2598359
7/11/01	11:59:26 UTC	11460	ON	VHS	24 37343175	83 05.2598359
7/11/01	11:59:26 UTC	11460	ON	SVHS	24 37343175	83 05.2598359
7/11/01	10:40 EST	690	PN	DIVE	24 43 22.14476	82 51 25.14326
7/11/01	10:40 EST	690	PN	SED_PEN	24 43 22.14476	82 51 25.14326
7/11/01	10:40 EST	690	PN	SED_SHR	24 43 22.14476	82 51 25.14326
7/11/01	10:40 EST	690	PN	CHL_BEN	24 43 22.14476	82 51 25.14326
7/11/01	10:40 EST	690	PN	SED_PART	24 43 22.14476	82 51 25.14326
7/11/01	10:40 EST	690	PN	SI_MIC	24 43 22.14476	82 51 25.14326
7/11/01	10:40 EST	690	PN	SI_MAC	24 43 22.14476	82 51 25.14326
7/11/01	11:27 EST	690	PN	FVC	24 43 22.14476	82 51 25.14326
7/11/01	11:27 EST	690	PN	HABTRAN	24 43 22.14476	82 51 25.14326
7/11/01	10:33 EST	690	PN	NUT_COL	24 43.470	82 51.128
7/11/01	10:33 EST	690	PN	CHL_COL		
7/11/01	11:00 EST	690	PN	NUT_COL	24 43.539	82 51.680
7/11/01	11:00 EST	690	PN	CHL_COL		
7/11/01	12:34 EST	632	PN	DIVE	24 43 26.32852	82 50 47.14697
7/11/01	12:34 EST	632	PN	SED_PEN	24 43 26.32852	82 50 47.14697

7/11/01	12:34 EST	632	PN	SED_SHR	24 43 26.32852	82 50 47.14697
7/11/01	12:34 EST	632	PN	CHL_BEN	24 43 26.32852	82 50 47.14697
7/11/01	12:34 EST	632	PN	SED_PART	24 43 26.32852	82 50 47.14697
7/11/01	12:34 EST	632	PN	SI_MIC	24 43 26.32852	82 50 47.14697
7/11/01	13:12 EST	632	PN	FVC	24 43 26.32852	82 50 47.14697
7/11/01	13:12 EST	632	PN	HABTRAN	24 43 26.32852	82 50 47.14697
7/11/01	12:52 EST	632	PN	LGT	24 43.321	82 50.307
7/11/01	17:10 EST	4671	PS	NUT_COL	24 37.277	82 49.149
7/11/01	17:10 EST	4671	PS	CHL_COL	24 37.277	82 49.149
7/11/01	17:15 EST	4671	PS	NUT_COL	24 37.309	82 49.241
7/11/01	17:15 EST	4671	PS	CHL_COL	24 37.309	82 49.241
7/11/01	17:15 EST	4671	PS	SI_PHY	24 37.309	82 49.241
7/11/01	19:36:55 UTC	4671	PS	ASP/BAT/QTC	24 37.5345056	82 49.0065398
7/11/01	19:42:18 UTC	4671	PS	VHS	24 37.5345056	82 49.0065398
7/11/01	19:42:18 UTC	4671	PS	SVHS	24 37.5345056	82 49.0065398
7/11/01	19:33:41 EST	4671	PS	ASP	24 37.265844	82 49.1941240
7/11/01	20:00:35 EST	4671	PS	ASP	24 37.3091806	82 49.3265097
7/11/01	19:36:55 UTC	4671	PS	WPT	24 39 20.88	82 49 13.74
7/11/01	19:18 EST	4671	PS	DIVE	24 39 20.88	82 49 13.74
7/11/01	19:32 EST	4671	PS	DIVE/FVC	24 37.396	82 49.553
7/11/01	19:18 EST	4671	PS	SI_FISH	24 37.396	82 49.553
7/11/01	19:18 EST	4671	PS	SI_FISH	24 37.396	82 49.553
7/11/01	19:18 EST	4671	PS	SI_FISH	24 37.396	82 49.553
7/11/01	19:18 EST	4671	PS	SI_FISH	24 37.396	82 49.553
7/11/01	19:18 EST	4671	PS	SI_FISH	24 37.396	82 49.553
7/11/01	19:18 EST	4671	PS	SI_FISH	24 37.396	82 49.553
7/11/01	19:18 EST	4671	PS	SI_FISH	24 37.396	82 49.553
7/12/01	8:23 EST	4671	PS	DIVE	24 37 24.42376	82 49 33.02736
7/12/01	8:23 EST	4671	PS	SED_PEN	24 37 24.42376	82 49 33.02736
7/12/01	8:23 EST	4671	PS	SED_SHR	24 37 24.42376	82 49 33.02736
7/12/01	8:23 EST	4671	PS	CHL_BEN	24 37 24.42376	82 49 33.02736
7/12/01	8:23 EST	4671	PS	SED_PART	24 37 24.42376	82 49 33.02736
7/12/01	8:23 EST	4671	PS	SI_MIC	24 37 24.42376	82 49 33.02736
7/12/01	9:03 EST	4671	PS	FVC	24 37 24.42376	82 49 33.02736
7/12/01	9:03 EST	4671	PS	HABTRAN	24 37 24.42376	82 49 33.02736
7/12/01	15:28:00 UTC	6772	ON	ASP/BAT/QTC	24 34.2641609	2 58.1892442
7/12/01		6772	ON	VHS	24 34.2641609	2 58.1892442
7/12/01		6772	ON	SVHS	24 34.2641609	2 58.1892442
7/12/01	1200 EST	6772	ON	NUT_COL	24 34.603	82 58.924
7/12/01	1200 EST	6772	ON	CHL_COL	24 34.603	82 58.924
7/12/01	1219 EST	6772	ON	NUT_COL	24 34.603	82 58.924
7/12/01	1219 EST	6772	ON	CHL_COL	24 34.603	82 58.924

7/12/01	1219 EST	6772	ON	SI_PHY	24 34.603	82 58.924
7/12/01	16:35:20 UTC	7265	OS	ASP/BAT/QTC	24 33.598864	82 58.1507568
7/12/01	16:35:20 UTC	7265	OS	VHS	24 33.598864	82 58.1507568
7/12/01	16:35:20 UTC	7265	OS	SVHS	24 33.598864	82 58.1507568
7/12/01	1236 EST	7265	OS	NUT_COL		
7/12/01	1236 EST	7265	OS	CHL_COL		
7/12/01		7265	OS	NUT_COL		
7/12/01		7265	OS	CHL_COL		
7/12/01	14:23 EST	6493	PS	DIVE	24 34 28.18371	82 54 05.09161
7/12/01	14:23 EST	6493	PS	SED_PEN	24 34 28.18371	82 54 05.09161
7/12/01	14:23 EST	6493	PS	SED_SHR	24 34 28.18371	82 54 05.09161
7/12/01	14:23 EST	6493	PS	CHL_BEN	24 34 28.18371	82 54 05.09161
7/12/01	14:23 EST	6493	PS	SED_PART	24 34 28.18371	82 54 05.09161
7/12/01	14:23 EST	6493	PS	SI_FISH	24 34 28.18371	82 54 05.09161
7/12/01	14:23 EST	6493	PS	SI_FISH	24 34 28.18371	82 54 05.09161
7/12/01	1500 EST	6493	PS	FVC	24 34 28.18371	82 54 05.09161
7/12/01	1500 EST	6493	PS	HABTRAN	24 34 28.18371	82 54 05.09161
7/12/01	1402 EST	6493	PS	LGT		
7/12/01	1934 EST	6493	PS	DIVE/FVC	24 34 28.18371	82 54 05.09161
7/16/01	1834 EST			DRIFT	24 29.028	83 06.102
7/16/01	1841 EST			DRIFT	24 29.970	83 06.974
7/16/01	1850 EST			DRIFT	24 28.946	83 08.056
7/16/01	1850 EST			DRIFT	24 28.946	83 08.056
7/16/01	2043 EST	4		CTD/BONG	24 29.776	83 07.053
7/16/01	2137 EST	5		CTD/BONG	24 33.763	83 10.082
7/16/01	2237 EST	6		CTD/BONG	24 38.034	83 13.110
7/16/01	2333 EST	7		CTD/BONG	24 42.126	83 16.227
7/17/01		8		CTD/BONG	24 46.559	83 19.583
7/17/01		9		CTD/BONG	24 50.597	83 23.024
7/17/01		10		CTD/BONG	24 55.223	83 24.311
7/17/01		11		CTD/BONG	24 58.963	83 27.693
7/17/01	2045 EST	16		CTD/BONG	24 29.779	83 07.430
7/17/01	2134 EST	17		CTD/BONG	24 27.914	83 12.451
7/17/01	2309 EST	18		CTD/BONG	24 21.622	83 21.224
7/18/01		19		CTD/BONG	24 13.794	83 33.921
7/18/01		20		CTD/BONG	24 08.365	83 43.402
7/18/01	2106 EST	12		CTD/BONG	24 24.541	83 06.661
7/18/01	2218 EST	13		CTD/BONG	24 19.555	83 07.362
7/19/01	2352 EST	14		CTD/BONG	24 09.712	83 07.103
7/19/01		15		CTD/BONG	23 54.279	83 07.115
7/19/01	2100 EST	21		CTD/BONG	24 29.418	83 07.260
7/19/01	2157 EST	22		CTD/BONG	24 25.824	83 01.989
7/19/01	2323 EST	23		CTD/BONG	24 19.924	82 01.928

7/20/01		24	CTD/BONG	24 10.134	82 43.040
7/20/01		25	CTD/BONG	24 00.535	82 30.658
7/20/01	1231 EST		DRIFT	24 29.000	83 08.000
7/20/01	1305 EST		DRIFT	24 30.000	83 07.000
7/20/01	1352 EST		DRIFT	24 29.000	83 06.000
7/20/01	2148 EST	3	CTD/BONG	24 23.016	82 51.961
7/21/01		2	CTD/BONG	24 21.066	82 32.178
7/21/01		26	CTD/BONG	24 17.007	82 15.590
7/21/01		27	CTD/BONG	24 19.949	82 00.369
7/21/01		28	CTD/BONG	24 25.197	81 52.250